EDUCATIONAL PSYCHOLOGY

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PREFACE TO THE REVISED EDITION

THE publication of this revised edition has made possible the inclusion of many recent findings in the psychology of learning. The authors were able, through rewriting many pages and by bringing the references up-to-date, to continue in this book the kind of basic, broad, functional treatment that characterized the first edition.

Psychological and educational advancement during the past ten years confirm the authors' earlier stated belief that considerable progress has been made since the days when the function of formal education was to drill young people in certain fundamental tool subjects, to present for their assimilation a mass of factual and more or less abstract book content, and to inculcate those attitudes, ideas, and opinions concerning behavior and human interrelationships that reflected no more than individual teacher point of view. Modern educational theory and practice regard the learner not as a passive recipient of the wisdom of the ages but as an active, thinking, feeling human being, who needs to be guided toward the realization of all his inherent potentialities, thereby becoming a well-adjusted, useful, and happy member of his group.

Educational aims and teaching techniques must be geared to the ability, felt needs, and interests of every young person. The heritage from the past, the problems of the present, and the promise of the future constitute the foundations upon which young people should be helped to build those skills, knowledges, and attitudes that will serve them well as they attempt to discover their rightful place in world progress and prepare to meet their responsibilities in so far as it is within their power to do so.

If education is to be interpreted as a means of meeting an individual's gradually increasing need and desire for greater self-development and for an extensive as well as intensive knowledge and understanding of the elements in his environment, both tangible and intangible, it becomes the responsibility of those who are teaching or planning to teach to possess a sympathetic understanding of human values. They need to have a rich and accurate appreciation of (1) the physical, men-

tal, and emotional potentialities of those whose educational activities they hope to guide; (2) the teaching and learning outcomes they desire to achieve; and (3) the teaching techniques and procedures that can be expected to suit the needs of individual learners and at the same time meet successfully worthy educational objectives.

Mastery of teaching content is an essential part of teacher training. Equally important is a thorough understanding of the psychological principles that govern human behavior, especially in relation to the learning process. In *Educational Psychology, Revised Edition*, are presented the educational applications of psychological facts and principles that are of value to teachers and to college students who are preparing to teach. If this book serves its purpose of stimulating future teachers to comprehend and appreciate more deeply the great and noble task that lies before them, the time and energy expended in its writing will have been well spent.

The authors wish to express their gratitude to the publishers who granted permission to quote from their publications, in both the first and the revised editions.

Lester D. Crow
Alice Crow

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INTRODUCTION

In Part I the reader is given a general view of what educational psychology is and how an acquaintance with its content can be of value to those who are concerned with the education of young people. Since the treatment of the subject matter of this book is aimed especially at increasing teacher understanding of the objectives, materials, and processes of learning, Part I also includes a discussion of the teacher's functions and responsibilities in guiding pupil learning.

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FUNCTION OF EDUCATIONAL PSYCHOLOGY

A QUESTION commonly asked about an applicant for a job or a new member of a community group is "How much education has he?" Vocationally, the answer can give the prospective employer some information concerning the applicant's training in job requirements; socially, the number of years devoted to education becomes an index of prestige value.

Education, broadly interpreted, begins at birth and continues throughout a person's life span. The constant interactions between an individual and the animate and inanimate influencing elements of his environment are conducive to the development of the behavior adaptations that function as means of survival. Many of these adaptations are acquired with little or no consciousness of their being made. Others are developed as a result of conscious participation in definitely planned sequential experiences aimed at the achievement of general and specific educational goals.

ASPECTS OF EDUCATION

Informal versus formal education. The relatively unconscious learnings that are inescapable accompaniments of daily living usually are referred to as *informal education*. Planned programs of study represent *formal education*, or school learning. It is of the latter aspect of education that people are thinking when they ask about an individual's educational status. Psy-

chologists and educators in no way minimize the significance in an individual's life of his incidental learning. They recognize, however, the value of utilizing psychological principles in attempts to help young people (and sometimes adults) benefit from formal educational experiences in so far as individual ability and interest persist in successful achievement.

Schools, both public and private, have been established as definite formal agencies to meet the educational needs of all age groups. Society has accepted the responsibility for organizing schools, for providing buildings and equipment, for establishing educational rules and regulations, and for guiding the training of teachers through setting up minimum standards. There still can be found, however, a decreasing number of non-licensed "schools" that purport to train would-be writers, artists, fashion designers, business executives, and the like.

Among the many existing informal educational agencies are the home, church, playground, library, press (especially the comics), club, theater, motion pictures, radio, and television. Many educational leaders believe that the last three constitute the most important educational influences in the lives of young people, as well as of adults — schools not excepted.

Human development and education. Development, as applied to the various areas of behavior, is characteristic of human nature from conception throughout life. The prenatal period, childhood, and adolescence usually are referred to as representing sequential maturation or development toward adult maturity. The habitual behavior patterns and understandings acquired during these developing years are aimed at serving the individual effectively in his life activities and relationships.

The terms *development* and *learning* sometimes are used synonymously. Their connotations differ, however, in that learning mastery in any area is dependent upon development readiness to profit from exposure to incidental or planned learning-stimulating situations. By the time a young child is ready for formal school training, he engages in activities appropriate to his early maturing potentialities. Thereby he acquires (1) some knowledge concerning his immediate environment, (2) sufficient motor control to meet his personal needs, (3) language skills that enable him to engage in simple conversation, and (4) some understanding of personal and group relation-

ships. The function of formal education or school learning is to set conditions that are favorable for the continued mastery of those knowledges, skills, and attitudes begun in the home during early childhood.

From the psychological viewpoint, education implies change and can be regarded either as *process* or as *product*. Education as a *process* embodies all those forms of activities that fit an individual for social living and that help transmit customs, laws, religious beliefs, languages, and social institutions from one generation to another. It builds upon the experience of one generation for the betterment of the next. Through the educational process an individual is stimulated to think, to appreciate, and to act. Desirable educational outcomes are realized when thinking and behavior serve the needs of the individual and the welfare of the group. Hence education is an individualizing and a socializing process that furthers personal advancement as well as social living.

The *products* of education include all those changes that have taken place as the result of an individual's participating in learning experiences. Educational goals vary with cultural demands and individual potentialities and ambitions. Hence educational products, as representative of the total effect of learning, differ among cultural groups and between members of the same group.

Regardless of the kind or extent of established goals, education is a dynamic force whereby optimum individual and social competence is furthered. Since learning involves learner activity, educational theory and practice must represent the application of scientifically-derived knowledge concerning human growth and maturation. Attention must be given to the selection of appropriate learning materials and to the gearing of teaching techniques to meet learner needs.

Educators are becoming increasingly alert to the results of psychological studies that deal with (1) individual patterns of growth, (2) maturational readiness to learn, and (3) individual differences in rate and limit of learning. Educational psychology, as an area of psychological study, is exerting a powerful influence upon the formulation of educational objectives, the construction of school curriculums, and the organization of teaching-learning procedures.

CONTRIBUTIONS OF PSYCHOLOGY

Meaning of psychology. Briefly defined, *psychology is the study of human behavior and human relationships.* An individual's *behavior* consists not only of his observable acts but also of all of his reactions to inner states and to environmental factors of influence. The human organism is extremely complex; the environmental factors that can affect the organism include all the persons, objects, situations, and conditions that constitute the external world of any living individual.

Any person's interactions with his environment represent many different kinds of experiences that vary in intensity and value to himself and to others. Psychology is concerned with discovering the ways in which individuals and groups, at different age levels, tend to respond to environmental stimuli. To the present, some tentative psychological principles have been evolved. According to data obtained from scientifically conducted studies of human behavior, it has been concluded that people tend to react similarly in certain situations and under certain conditions.

Basic psychological assumptions. Although human behavior seems to follow certain general trends, individuals tend to respond differently to elements in specific situations. Psychologists are interested in the *why* as well as the *what* of both similarities and differences among human reactions. Various schools of thought have arisen from attempts that have been made to explain human reaction patterns.

As modern psychologists continue their studies of cause and effect relationships, they are basing their research upon several assumptions concerning individual behavior which they consider to be basic characteristics of human nature. To the educator, the most pertinent of these assumptions are:

1. Human behavior is functional and dynamic.
2. At every stage of development, an individual's reactions are influenced by the effect of his experiences with people, things, situations, and environmental conditions upon his desire to satisfy felt needs, wants, and urges.
3. A person's reactions usually represent the functioning of a total integrated pattern of behavior; at times, however, certain behavioral elements or aspects may exercise a significant influence upon what he thinks or does, and how he feels.

4. No one study approach utilized to the exclusion of others can be expected to yield adequate psychological data.

The value of educational psychology. The foregoing discussion deals chiefly with the basic principles underlying human behavior that constitute the subject matter of *general psychology*. The study of the many kinds of interaction among living beings is so all-embracing that special consideration of any one area is broad, both in scope and in content. Psychological study and application include many subdivisions; of these the content of *educational psychology* has significant value for school people.

Educational psychology describes and explains the learning experiences of an individual from birth through old age. Its subject matter is concerned with the conditions that affect learning. Since teachers, counselors, and other school personnel need to possess as complete an understanding of human nature as is possible, the subject matter of educational psychology is reflecting increasingly intensive and extensive research in the field.

Although educational psychology is a relatively new science, it is rapidly developing a body of reliable and pertinent subject matter. Educational psychologists have conducted and are continuing to conduct laboratory and classroom learning studies that are carefully planned and expertly executed. In addition, they are utilizing appropriate, scientifically obtained data from other fields of study: biology, sociology, social anthropology, medicine, psychiatry, and other branches of psychology.

Educational psychology can be regarded as an applied science, in that it seeks to explain learning according to scientifically determined principles and facts concerning human behavior. In the light of available data, the educational psychologist attempts to discover:

1. The extent to which the factors of heredity and environment contribute to learning
2. The nature of the learning process
3. The relationship that exists between maturational level and learning readiness
4. The educational significance of individual differences in rate and limit of learning
5. The inner changes that occur during learning
6. The relation of teaching procedures to learning outcomes

Principles of human development. Certain basic facts that have been scientifically discovered and interpreted concerning human development need to be known and understood by any man or woman who is planning to enter the teaching profession. *Psychology* explains the *how* of human development as related to learning; *education* attempts to provide the *what* of learning; *educational psychology* is concerned with the *why* and *when* of learning.

A normal individual is born with a physical structure and with potential physiological functions that enable him to become an active human being. To the extent that his sensory mechanisms, located in the eyes, ears, tongue, nasal cavities, inner organs (the viscera), and muscles, function adequately he gains necessary awareness of himself and the world about him. Through the activity of his muscles and ductless glands, as these function in harmony with his nervous system, he achieves the power to adjust to the many demands made upon him in his day-by-day living.

Various forms of energy serve as stimuli that activate the neural endings of appropriate sense organs. Sensation results as sensory impulses reach the cerebrum, that part of the brain which is the seat of consciousness. As meaning is given to a sensation, the sensation becomes a perception. By way of the complex and delicate interaction of his body, the individual responds or behaves in accordance with the sensations which he experiences. He thinks, he feels, he acts. Any particular response or complex of responses depends not only upon the nature of the environmental stimuli which bring about the response but also upon inner conditions of the organism at the time of the reaction. Certain forms of inner activity are concerned with the process of living itself and are automatic in their functioning, except as normal activity is interfered with by stimuli, such as disease or drugs, that may affect the auto-

nomic nervous system. Included among these autonomic functionings are respiration, heart action and blood circulation, the assimilation and digestion of food, and the elimination of waste matter.

Life means change. From the moment of conception, the new organism passes through developing stages: prenatal, neonatal, infancy, childhood, adolescence, adulthood. The physical or anatomical structure grows in size, contour-formation, and strength. The physiological or organic functions become increasingly adapted to meet life needs. The development of innate potentialities is referred to as *maturation*. A knowledge of the stages of maturation through which the individual can be expected to pass is important to all who attempt to guide the learning process.

An individual's growth and maturation can be helped or hindered by the environmental stimulations to which he is exposed. The developing organism can be prepared or conditioned to meet certain life situations by the building up of responses to less adequate stimuli through the association of these stimuli with others that tend to be stronger for the individual. For example, a worker responds to the noon whistle by going to lunch.

Educational psychology in practice. Degree of success in teaching depends to a great extent upon degree of sensitivity to the developmental progress, the emerging needs, and the innate potentialities of learners.

A teacher should be thoroughly grounded in the subject matter to be taught. He also must understand as completely as possible (1) the nature of each individual pupil and his developmental probabilities, (2) the personal and social adjustments to be made by every young person in our present cultural milieu, and (3) the psychological factors inherent in the teaching-learning process.

Utilizing his understanding of the human mechanism and its functions, the teacher can adapt his techniques and procedures to individual patterns of development so that the learner is helped to profit from instruction. Effective teaching and learning enable the learner to (1) achieve desirable patterns of behavior that become a part of himself in the form of useful habits, (2) acquire knowledge concerning himself and the world about

him that will form the basis of constructive activity, and (3) develop feelings of satisfaction or annoyance and emotional reactions that will benefit him in relating to his associates and in meeting his personal needs.

RESEARCH IN EDUCATIONAL PSYCHOLOGY

Research beginnings in the United States. European psychologists of the nineteenth century devoted considerable attention to studies dealing with sensory experiences and mental imagery. Although these areas of psychological inquiry have been continued both here and abroad, American psychologists have become intensely interested in the promulgation and application of scientifically evolved principles and theories of learning.

Toward the close of the last century, Edward I. Thorndike, as a result of his experiments with animals, formulated laws of learning that seemed to confirm his belief concerning the trial and error nature of learning. Later Thorndike utilized the experimental approach in attempts to discover the basic principles that underlie learning differences among human beings. His intensive and comprehensive findings are reported in his *Educational Psychology*, consisting of three volumes: (I) *The Original Nature of Man*, (II) *The Psychology of Learning*, and (III) *Work, Fatigue, and Individual Differences.* In his writings, Thorndike stressed the need for a scientific approach to the study of education.

Among other early psychologists interested in the psychological aspects of education can be included William James, G. Stanley Hall, and Charles H. Judd. Hall, in his monumental study of adolescent boys and girls (published under the title *Adolescence*), utilized the questionnaire approach. The contributions of men such as these motivated an increasing number of American psychologists, educational psychologists, and educators to engage in scientific research aimed at finding solutions to problems inherent in teaching and learning.

Purpose and limitations of educational research. Successful educational practices are based upon formulated psychological principles that evolve from the application of scientific methods to the problems of human development and learning. An attempted approach to any educational problem may be

limited, however, by the nature of the problem itself or by the difficulty of establishing adequate controls. The subjects of study are dynamic, sometimes unpredictable, young people. Furthermore, scientifically evolved principles may fail to operate successfully if a teacher who attempts to apply them does not understand their functioning.

An evolved principle also may be ineffective in its application because of failure on the part of the researcher to adhere strictly to objective, scientific procedures. To be valid, a study must be organized systematically, conducted carefully, and interpreted in terms of well-standardized norms. It should include the following steps:

Investigation — gathering a body of accurate data
Classification — arranging data according to appropriate categories
Verification — establishing the uniformity of results
Generalization — formulating a principle or law that is applicable to situations that duplicate the conditions of the original investigation

Commonly used study approaches. Much of the research in the so-called "pure" sciences is conducted under objectively controlled laboratory conditions. Many psychological principles have evolved from laboratory studies of individual learning processes. However, more comprehensive investigations that deal with the psychology of teaching-learning relationships must be carried on in classroom situations. Of necessity, the control of variables in a classroom study is less rigid than it can be in a laboratory.

The educational psychologist may utilize one or more approaches in a particular area of study. Although usable information can be obtained by means of nonscientific or semiscientific methods, the utilization of techniques that yield objectively obtained data usually is more profitable.

The research methods commonly used by educational psychologists can be classified broadly as:

Introspection
Observation
Genetic approach
Evaluating techniques
Experimental method
Statistical analysis

Not all of these methods are mutually exclusive. For example, data obtained through the utilization of one or more of the various techniques may need to be subjected to statistical analysis (See Chapter 20).

Introspection. The recalling of one's own experiences or the evaluating of one's own feelings or thinking processes was a much-used study approach among earlier psychologists. At present, introspection or self-observation is considered relatively unreliable. Personal bias or disturbed emotional state may interfere with objective self-appraisal. Yet this method has value in attempts to discover mental activities that defy objective measurement, such as an individual's dream life.

Observation. Casual observation of one's own behavior or of the actions of others is a common practice that tends to be subjective and inaccurate. Under carefully controlled conditions, however, a well-trained, experienced psychologist or teacher can learn much from his observation of a learner's behavior. Objectively written reports of such observations aid in the diagnosis of learner difficulties.

Genetic study approach. In the genetic method of studying human growth and development, either or both of two approaches can be utilized: (1) the *cross-sectional* (horizontal), and (2) the *longitudinal* (vertical). Many psychological principles concerning growth and developmental trends have resulted from carefully controlled cross-sectional studies of large numbers of individuals of the same age level at various stages of development.

Although the sole use of the cross-sectional method may yield pertinent data concerning general growth changes, the longitudinal approach is needed to study the sequential growth or developmental progress of one individual or group. Hence the most valid data on human development probably can be obtained by starting with a large number of infants and continuing to study the sequential growth pattern of each to adulthood. A long-range project of this kind is costly and might become cumbersome. Some have been attempted and completed, however; others are still in progress.

Evaluating techniques. Various techniques have been employed by educational psychologists to obtain data concerning learners and their reactions. These techniques include the questionnaire,

the standardized measuring instrument, interviewing, and the case history or clinical approach.

The questionnaire or check list is aimed at discovering facts about any matter being investigated. No attempt is made to control the situation; the purpose is to study and interpret the situation by describing what has been discovered. The procedure followed is first to formulate questions that will assist in discovering the facts desired or to use a set of questions that has served a similar purpose. The questions then are submitted to the persons selected for the study. The answers become the raw material which is used to determine pertinent conclusions or generalizations relative to the purpose of the questionnaire.

This technique is not considered highly scientific. The questions may not be well organized, sufficiently searching, or productive of definite response. The responders may misinterpret the questions and answer them inadequately, thereby decreasing the reliability of the data. The questionnaire may not be returned by a large enough sampling of those to whom it is submitted.

In some areas of investigation, however, the questionnaire method can be used effectively. An evaluation of an individual's observable behavior characteristics that represents the pooled judgments, obtained from questionnaires, of many associates is likely to be more valid than the opinion of any one person. Moreover, it is a relatively easy and quick method of accumulating data, since questionnaires can be distributed to many people who probably could not be reached otherwise.

Standardized measuring instruments. Standardized measuring instruments are, in effect, questionnaires administered to selected individuals under prescribed conditions. The subjects are not always expected to know the answers to the questions, nor are they given an opportunity to find the answers. Since these instruments require immediate response, frequently on a timed basis, the responders are expected to answer out of their background of knowledge, opinion, or attitude.

Various types of instruments are employed to measure intelligence, physical characteristics, degree of school achievement, personality traits, individual interests, and similar factors. Appropriate norms have been established by administering the questionnaires to large numbers of individuals. This

procedure allows for an interpretation of results that are meaningful to those who are experienced in working with them.

Interviewing. Interviewing is a technique that should be used in connection with other techniques whenever and wherever possible. The value of the questionnaire is greatly enhanced if the answers to it can be amplified by the facts obtained through a personal interview. The skilled interviewer can discover many facts about the person interviewed that cannot be obtained by more impersonal measuring techniques. During the interview, the interviewer not only obtains specific data that can be subjected to statistical treatment but is afforded an opportunity to study subtle behavior responses of the person interviewed.

The case history or clinical approach. The case history usually is limited in its application to attempted solutions of serious learner difficulties. This approach is not concerned primarily with the promulgation of psychological or educational principles. Its purpose is preeminently diagnostic, although, as case histories are constructed and studied, certain cause and effect behavior trends among young people may be revealed.

A case history includes the past history of an individual as well as his present status; it points the way toward remedial treatment. A carefully organized and completed case study includes data concerning family and social background, physical health, and emotional and educational development. Included also are the individual's interests, hobbies, and present activities, as these may have a bearing upon the problem to be studied. An analysis of the data accumulated in the form of a case history should result in the discovery of pertinent causes for behavior, recommendations for guidance, and the application of remedial measures.

Every child is the product of a great variety of hereditary and environmental influences. If a child gives evidence of any form of maladjustment, the case study technique, when properly used, provides a means whereby the causes of the maladjustment can be discovered. Through the utilization of this technique, emphasis can be placed upon significant underlying factors rather than upon displayed symptoms of overt or observable behavior alone.

Experimental method. The purpose of a psychological experiment is to "test" a belief or opinion concerning human behavior in

a given situation or under given conditions. An experiment differs from controlled observation in that the conditions of the experiment are relatively artificial in comparison with the more natural setting in which behavior is observed.

The control of conditions is basic to the experimental procedure. The factor to be "tested" must be defined exactly. Then two groups are set up — the *experimental* group and the *control* group. These two groups are supposed to be similar in every respect except for the *independent variable* or experimental factor (EF). The control group is used as a check upon the extent to which the experimental group is affected by the independent variable.

The members of both groups are subjected to the administration of one or more of the research methods described briefly in the foregoing pages. Resulting data are organized and interpreted in accordance with the purpose of the experiment, and an appropriate principle or theory is formulated. The validity of experimentally derived outcomes depends upon (1) whether the dependent variables of the two groups are constant factors, and (2) whether the groups differ only in the presence or absence of the EF.

Carefully planned and objectively conducted experimentation probably is the most exact and refined method of research. Reference was made earlier in the chapter to the fact that laboratory studies generally are less affected by subjective elements than are those studies conducted in classroom situations. This difference applies especially in the utilization of the experimental method. Variables can be controlled better in a laboratory situation. Furthermore, the simpler the problem, the fewer the factors or elements to be considered or controlled.

Laboratory experiments have supplied significant data concerning behavior reactions in relation to learning. A few of the important contributions to educational psychology are Ebbinghaus's experimental studies of the functioning of memory, Thorndike's experiments with animals, and Pavlov's findings concerning conditioned behavior. Laboratory studies also have dealt with eye movement in reading, the effect of distraction (noise, excessive heat or humidity, etc.) on ability to concentrate upon learning tasks, the length and distribution of practice periods in skill mastery, and other specific factors and condi-

tions that exert a potent influence upon learning effective-
ness.

Many aspects of learning can be studied best through the
application of experimental methods to classroom situations.
It is only in classroom teaching-learning situations that certain
educational principles can be applied and results evaluated.
Experiments can be conducted to discover the psychological
bases of educational problems, such as (1) comparative effective-
ness of different teaching approaches, (2) optimum class size,
(3) value of integrated learning as represented by the core
program, (4) extent to which and ways in which transfer of
learning takes place, (5) advantages and disadvantages of
homogeneity or of heterogeneity in grouping learners, (6) con-
struction of curriculums to meet individual and societal needs,
and (7) utilization of appropriate materials and techniques to
evaluate learner abilities and interests and learning progress.
The educational problems listed here represent only a few of the
many phases of formally organized and structured teaching and
learning activities to which experimental methods of study can
be applied.

Experimentation in educational situations can utilize any
of various approaches. Extensive studies are conducted simul-
taneously in entire schools, in school systems of one city or
county, or in several school systems scattered throughout the
country. An experimental activity program was continued in
New York City for more than ten years. Another elaborate
experiment is the Eight-Year Study of high school-college
relations. Various long-range studies are now in progress —
for example, the experiment of permitting mentally superior
young people to enter college at the end of their junior year
in high school.

Some causes of research inadequacies. Throughout the
discussion of research in educational psychology, attention has
been directed to the importance of accuracy and objectivity
in the conduct of any study project. A researcher or group of
researchers may be well-intentioned, painstaking, and meticu-
lous in the administration of various types of study techniques
or in the conduct of an experiment. Yet there may be imper-
ceptible elements in the situation that have a subtle influence
upon the results. Incompleteness of data interpretation or

unwarranted application of conclusions also may be a cause of research inadequacy.

Some of the possible difficulties inherent in psychological and educational investigations are summarized briefly as follows:

1. The human factor is unpredictable. Individuals may vary from day to day in their feelings or in their power to perform.

2. The members of a group of children or young people, no matter how carefully they are selected for study purposes, differ among themselves in physical status, specific habits, abilities, and interests.

3. A well-trained, experienced investigator may experience difficulty in communicating adequately with certain of his subjects or groups of subjects who function on an intellectual level too far removed from his own. Consequent misunderstanding or lack of understanding by the subjects of suggestions or directives may skew the results of the study.

4. A conclusion resulting from the study of a small number of cases or from data representing the performance of the members of one sub-cultural group or of one age level may be reported as a theory or principle that has general application. Unfortunately, some reputable psychologists and school people are guilty of this error.

5. A study, especially a learning experiment, conducted in a small selected school system yields conclusions that apply adequately in that situation. If the results of the study are applied in a large, differently organized school system, however, they may fail completely to meet avowed aims or objectives.

6. An educational theory, principle, or practice that functioned well at the time of its development may continue to influence teaching-learning procedures, even though earlier validating conditions have changed considerably.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss the extent to which educational psychology has attained the status of a science.
2. List the important community agencies that influence education. Which do you consider to be the most important?
3. Indicate specific ways in which general psychology differs from educational psychology.

4. To what sources should educational psychology turn for the determination of its subject matter?

5. Suggest difficulties that might be associated with a learning experiment.

6. Suggest studies or experiments in the field of educational psychology in which introspection, the questionnaire, or the interview can be used.

7. What special training is needed to prepare an individual to conduct learning experiments?

8. Compare the laboratory experiment with the classroom method of experimentation in learning. Why do we need both?

9. Describe an experiment in learning that you would like to see completed. One in which you would like to participate.

10. To what extent should each teacher participate in learning experiments in the classroom?

11. Team up with another student to observe the same child for at least 20 minutes. Then, without conferring with each other, present a detailed written report of your observations to the class. What differences are noted?

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2

EDUCATIONAL PSYCHOLOGY AND TEACHING

THE learning process and the teacher are closely associated. Although the teacher cannot do the actual learning for a pupil, effective teaching is pupil guidance. The learner needs to be stimulated. It is the teacher who provides the kind of stimulation that will enable the child to become an active learner.

Leaders in education — administrators, teachers, and interested laymen — plan new educational programs; but it is the teacher who guides and inspires the young. The teacher, patient in his duties, attacks ignorance and misunderstanding. He transmits his own joy of living and learning as he shares with his pupils the rich experiences of his life. He lights the torch of learning which later may shine out over the world. He engenders the love of knowledge through personal contact as he helps his pupils gain this knowledge through books and other avenues of learning.

The teacher is a bulwark of democracy. Children not only should be taught about democracy but while they are in school should be given an opportunity to experience the democratic way of life. The teacher shoulders this great task of education. It is neither the number of hours nor the units of work accomplished that measure the worth of a teacher. Teaching is more than the aggregate of the many acts associated with the classroom. It includes also the total influence that the teacher exerts on his learners, both within and outside the school. The superior teacher possesses the creative proficiency of an artist, the precise attitude of a scientist, and the perfected skill of a craftsman.

PSYCHOLOGICAL ASPECTS OF TEACHING

We have not arrived at the ultimate in psychological teaching techniques, but we are gradually emerging from a state of educational floundering. Although there is likely to be a lag between experimental findings and practical applications, it is the duty of the teacher to keep informed concerning the results of educational research. This is a "must" during the pretraining period and is becoming a professional requirement after teaching begins. The teacher must be able to (1) direct or guide learning; (2) motivate pupils to learn; (3) help pupils develop desirable attitudes; (4) improve teaching techniques; and (5) recognize and achieve those personal qualities that are conducive to successful teaching. We shall discuss briefly these five psychological aspects of teaching.

Directional aspect. The directional phase of teaching becomes effective in so far as a teacher attempts to condition a learner toward meeting progressive changes in his environment. The effect upon a learner of the environment in which he is active is of prime importance. The teacher does not start the learning. He merely sets the stage, provides the material, gives encouragement, and makes possible learning activity directed toward the realization of educational aims that are worthwhile in a democracy.

Motivation aspect. The application of the principles of interest and enjoyment is basic to effective learning at any age or grade level. Present-day psychology emphasizes the value of satisfaction in learning. The teacher should aim to arouse the interest of his pupils by giving them attention as individuals and by adapting his methods and materials in such a way that they stimulate pupils to gain satisfaction from learning activities. The purpose is not to reduce study to the play level but to introduce some of the play attitude into the learning situation. Learning is serious business, but it can be undertaken with interest and enjoyment without losing sight of its fundamental purpose.

Attitude development aspect. The emotional experiences of pupils that are, in effect, by-products of a teaching-learning situation reflect the influence of the teacher as a person. Attitudes are not mere accidents of individual experience. They result from day-by-day living in the home, in the school, and
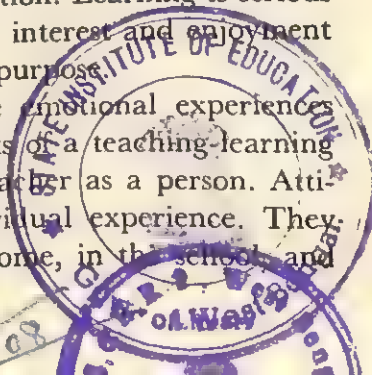
in the community. These attitudes may have local significance in that they affect behavior in the home, in the classroom, or on the playground. They may reach out and touch the larger mores of the group; they may be nation-wide or world-wide in their significance. Whatever attitudes children develop can be traced, in part at least, to the effect upon them of teacher precept and example.

The challenge to the teacher is that of helping the learner retain his identity, develop his individuality, and absorb a background of democratic culture. Theoretically, all of education is aimed at helping learners develop to the full extent of their ability those attitudes that fit them for living constructively in a democratic society. This task is difficult, since our educational system not only is complex but varies in its many aspects from state to state and even within states. Can national integrity be achieved while varying attitudes are developed in different school environments? This is a psychological problem that must be met directly by teachers in their respective school situations. The problem is aggravated by the diversity of interests that exist among teachers and by the different methods and techniques that are utilized to achieve supposedly comparable educational objectives.

Democracy in the classroom is accepted, in principle, as a desirable educational approach. The avowed objective of the teacher is to help his pupils develop those attitudes that are fundamental aspects of the democratic way of life. Hence, as a result of their school experiences, young people should learn to (1) respect the rights of other people, (2) recognize the extent to which their own rights need to be limited in the light of the common good, and (3) assume responsibility for their own welfare and for that of others who need assistance.

Unfortunately, too many children are encouraged to emphasize their rights and to minimize their responsibilities. Recognizing the fact that a growing child has many needs that must be satisfied, some parents and teachers become overconcerned about providing healthful conditions for growth. Thus they unwittingly foster in children the development of self-centered attitudes. Then too, adult attempts to inculcate attitudes of personal responsibility may meet youthful resistance. The need is great for teachers to help their students develop an under-

standing of both rights and responsibilities in a democratic society.

Technique aspect. With the increase in knowledge about maturation and learning, greater attention is being given to the developmental stages of a child during which he should be exposed in a formal way to different learning materials. Rapid progress has been made in the discovery of learning readiness in various areas. Walking readiness, reading readiness, and the like now can be discovered with some degree of exactitude. Providing educational stimulation when a child is ready to profit from it adds to the joy of learning, as well as to its effectiveness.

There is also psychological value to the learner in having ideas presented in a sequence that will enable him to understand them. The presentation of subject matter to be learned can follow a logical or a psychological approach. The order of presentation either of broad fields of knowledge or of individual topics within one field constitutes an important factor in subject-matter mastery. The logical approach follows a sequential pattern that is inherent in the subject material. The psychological approach begins with a consideration of the learner, his background, and his state of readiness (degree of maturation and mental set), and carries him by well-considered steps toward an appreciation of the concepts or generalizations that are to be learned. The logical approach may not embrace the psychological, but the psychological must, to a certain extent, include the logical.

We gain insight into the problems of learning sequences through the application of psychological principles that deal with learning readiness. There are various orders of procedure that may be followed, each having its own psychological basis. This is true in the learning of number concepts, foreign languages, geometry, science, or material in any other study area. There is not complete agreement among educators concerning the psychological value of any one teaching procedure. Nevertheless, each educator who recommends a certain procedure bases his selection of it upon what seems to him to be a good psychological reason. Some of these recommendations, including the relative value of specific privileges in the various study areas, will be discussed in detail in later chapters.

Personal aspect. Successful teaching is based upon the following components: intelligence, keenness of observation, and social competence. The individual who has better than average intelligence, who is a quick and careful observer, and who possesses a genuine interest in people is very likely to be successful in the application of established psychological principles as he functions in the classroom.

Whether a teacher is working with superior, average, or slow children, he himself needs to possess a high degree of intelligence so that he will be able to understand the responses of all his pupils. There also are other desirable personality factors, such as patience, interest in young people, and industriousness, that should be considered. Hence persons who have an intelligence quotient (I.Q.) of 120 or higher and who exhibit desirable personality qualities should be encouraged to enter the teaching profession.

The teacher who is a keen observer is sensitive to the responses of each of his pupils. He thus is enabled to prevent the occurrence of incidents in the classroom that might interfere with the even tenor of the teaching-learning situation. Too often restlessness or lack of cooperation prevails in a classroom because the teacher either is unaware of the factors of maladjustment that are operative or is unconcerned about the attitudes and responses of individual pupils. It is the responsibility of a teacher to be well acquainted with the psychology of child behavior and to recognize not only undesirable overt behavior responses but also the underlying factors that provoke such behavior.

The socially competent teacher has the power to apply psychology to the learning situation in subtle ways. He is able to prepare learners for social living. He works well with people — his pupils, his co-workers, his supervisors, the members of his community. Social competence is one of the teacher's prized possessions that he should strengthen as much as possible. The well-balanced and emotionally controlled teacher who is concerned with the fundamentals of attitude and behavior development in relation to group living is giving evidence of social competence that depends upon the possession of both social intelligence and broad social experience. The degree of success, however, even of the socially competent teacher, is dependent upon the teaching and learning conditions with which he is confronted.

FUNDAMENTAL BASES OF EFFECTIVE TEACHING

That effective teaching comprises more than the assigning and "hearing" of lessons is a relatively recent educational recognition. The present emphasis on the careful selection and thorough preparation of men and women who want to enter the teaching profession stems from the results of psychological studies dealing with the various aspects of human development and with the fundamental principles of learning. An increasing appreciation on the part of parents, psychologists, and educators of the effect upon an individual of his childhood and youth experiences has created a demand for psychologically oriented and personally fitted teachers.

Teacher competencies. Traditionally, the mastery of appropriate subject matter was the primary, sometimes the sole, requirement for teaching. But although teacher-learner relationships were not stressed, there always have been great teachers who influenced not only the thinking and behavior of their pupils but also the attitudes of their societal group. The number of master teachers was small, however, until analytical studies of teacher competencies were undertaken. The findings of already-completed and still-continuing investigations in this field have resulted in the establishment of teacher-training divisions in colleges and universities. In respect to principles underlying effective teaching, educators responsible for teacher training constantly are attempting to improve their methods for selecting candidates, their curricular offerings, and their own instructional approaches.

The many adjustive aspects of living in our modern complex society require that teachers be well qualified to assume their teaching responsibilities. Programs of teacher education, both pre-service and in-service, have become increasingly effective. There are certain qualities, however, that are inherent in an individual's total personality pattern reflecting the effect upon his inherited potentialities of early experiences. An habituated attitude or behavior pattern might serve a person well in some areas of activity but not be conducive to the development of teaching effectiveness. Hence the screening of applicants for programs of teacher education is extremely important.

Increasing emphasis is being placed upon basic areas of

teacher competence. In order to insure effective teaching, consideration is given to the prospective teacher's

1. Mastery of subject matter to be taught
2. Physical and health status
3. Personal attributes and emotional control
4. Understanding of human nature and development
5. Knowledge of and ability to apply the principles of learning
6. Sensitivity to and appreciation of cultural, religious, and ethnic differences
7. Interest in continued professional improvement and cultural enrichment

No one of the listed areas of competency should be regarded as the sole or primary factor of success. Teaching, like learning, is an integrative and integrated process in which the functioning of one phase or facet influences the functioning of the others. In order to clarify these interrelationships, brief comments are presented here.

Mastery of subject matter. That a teacher should know the subject matter he is expected to teach would seem to be a self-evident fact. Yet one cannot assume that a person's knowledge or perfection of skill resulting from study of textbooks and classroom experiences is all that he needs to impart to others what he has learned. As used here, the term *mastery* implies that the teacher not only knows what he is teaching, but also can organize and adapt materials in accordance with his students' ability and interest level.

For an expert in a field of learning to place himself in the position of a beginner may be a difficult task. For example, a well-known research psychologist was an ineffectual teacher of elementary psychology but was extremely successful with graduate students. Although he was an expert in his field, his own study had gone so far beyond simple fundamentals that he expected his students to understand and deal with technical terminology and complex concepts.

Physical and health status. For a teacher to be crippled can be a cause of danger. Some physical defects are unsightly. Delicate health or poor physical stamina may incapacitate a person for the adequate performance of teaching activities.

The effective teacher needs to be free from physical or health difficulties. Teaching is an energy-consuming job. A teacher's

absence that is caused by ill health interferes with the continuity of the teaching-learning process. Even though he is present, a teacher who does not feel well cannot function as adequately as he could if his health were better. Consequently, in most school systems and teacher training institutions, prospective teachers are screened for health. In addition, a teacher who contracts an infectious disease, such as tuberculosis, or who is affected by any other form of sickness is granted a leave from duty for restoration of health.

Personal attributes and emotional control. A teacher's overt behavior and expressed attitudes exert a powerful influence upon young people. Hence it is imperative that he be an honest, sincere person whose ethical standards are worthy of imitation. Careful grooming, pleasing voice, good diction, and habitual use of acceptable grammar also are important.

During the course of any school day, a teacher can be subjected to the challenge of dealing with uncooperative, uncontrolled, or defiant pupil behavior. He needs to be emotionally stable in such situations. Although learners themselves are expected to meet reasonable standards of self-control and study effort, their activities should be guided by a teacher who is calm, cheerful, and understanding of child behavior. He should be objective and firm in requiring his pupils to meet their classroom obligations, but he also should exercise patience in helping them overcome personal or learning difficulties.

Understanding of human nature and development. A man or woman may be temperamentally fitted to teach and very much interested in working with young people but, unless he has adequate knowledge of the sequential pattern of human development, he is likely to be an ineffective teacher. The causal factors underlying the many vagaries displayed in child and adolescent behavior must be understood by a teacher so that he can provide opportunities for his pupils to achieve greater reactional consistency.

One of the marked differences between traditional and modern programs of preparation for teaching is the present emphasis upon teacher understanding of human developmental patterns. The growing trend, however, among colleges and universities is to require teacher trainees to build their specialized training upon a good liberal arts base and a thorough knowledge

of subject matter. In addition, teacher education programs include opportunities for actual experience in working with developing young people as an accompaniment of classroom study of psychological theory.

Knowledge and application of learning principles. The importance of applying scientifically derived psychological principles to teaching and learning was discussed earlier in the book. The ways in which these principles can be utilized constitute much of what is contained in the chapters that follow.

At this point, it probably is sufficient to re-emphasize the fact that discretion is needed in the application of principles or theories of learning. *What* should be taught, and the *why*, *when*, and *how* of teaching are dependent upon various factors: individual and societal needs, learner readiness, and available teaching-learning opportunities and materials. Furthermore, no matter how well the neophyte has been prepared to enter teaching or how great his interest in his chosen profession is, he may become discouraged at the beginning of actual teaching. He is likely to discover that the application of apparently valid teaching approaches does not seem to yield successful results. Constant adaptation of these principles to existing conditions is basic to teaching effectiveness. This skill can be acquired only through practical experience.

Sensitivity to and appreciation of differences. In the United States especially, the teacher needs to be sensitive to and appreciative of cultural, religious, and ethnic differences among the people with whom he associates professionally. Regardless of his own ethnic and cultural background and his religious affiliation, the teacher's attitude toward his pupils, fellow teachers, and other school personnel must be unbiased and objective. Nor should he attempt to influence the thinking of young people in accordance with his personal views on social and political issues.

Unless an individual can understand differences among young people that stem from their home and neighborhood experiences, sympathize with them and appreciate the value of their contributions to group living, he should not select teaching as a vocation. A young person is a human being with developmental potentialities. It is the teacher's privilege, as well as his responsibility, to accept the learner as he is and to

help him become a constructive, well-adjusted citizen within the framework of his social heritage.

Continued professional and cultural improvement. A teacher's education is not completed when he is certified to teach. What may have been adequate teaching methods at that time may fail to meet later educational demands or may need to be changed in the light of the results of continued psychological research. Increasing media for professional growth are being made available. A few of these are in-service courses, professional organizations, and psychological and educational journals.

Travel, avocational activities, and utilization of other cultural opportunities not only enrich a teacher's out-of-school life but also enable him to give his pupils vicariously enjoyed experiences. A teacher who is conscientious but who limits his interests almost entirely to classroom activities may lose his zest for teaching. Contrariwise, too many outside interests can interfere with teaching effectiveness.

Investigations of teaching success. Research studies dealing with success in teaching have yielded relatively unsatisfactory findings. That there are differences between the "good" and the "poor" teacher has been determined by observation of teachers in action, recording of classroom activities, and questionnaires submitted to supervisors, teachers, and students. The relative significance of such differences has not yet been ascertained, however.

Teaching is an art as well as a skill. Subtle interactions, difficult to discover, may exert a potent influence upon the degree of effectiveness. Yet statements of standards can be formulated. Such a one is the Future Teacher's Pledge, which emphasizes the need of competency in fundamental attitude and behavior areas.

QUESTIONS AND TOPICS FOR DISCUSSION

1. How can a knowledge of educational psychology help a teacher of fourth-grade children?
2. "The teacher is a bulwark of democracy." Explain.
3. Why should a teacher attempt to motivate learners?
4. Describe what you consider to be the greatest responsibility of a teacher.

5. To what extent does a child develop his attitudes before he starts to school? What part can a teacher play in attitude development?
6. What is meant by insight?
7. Discuss the advantages to learners of high physical, intellectual, and ethical standards of teachers.
8. How high should "interest in people" be on a list of desirable teacher traits?
9. Why should a teacher be able to understand the behavior of others?
10. To what extent should a teacher influence the behavior of others?
11. Think of an excellent teacher that you have had. List his characteristics that caused you to think of him as a superior teacher.

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Part II

GROWTH AND DEVELOPMENT

MATURATION or growth from conception onward is a natural phenomenon. The direction which growth takes as a result of factors outside the maturing or growing individual may be referred to as development. Maturation as a natural process and development as a result of the effect of environmental conditions upon the young person as he grows are two factors basic to the teaching-learning process. In PART II are discussed growth and development in general and the interrelation of the various factors of individual development. A knowledge of these processes is fundamental to the setting up of educational objectives, to the planning of curriculums, and to the devising of teaching techniques for all learners at their various stages of individual development. Physical, mental, emotional, and social development forms the basis upon which are built those behavior characteristics which, as the growing child is guided through the learning process, result in the kinds of behavior that cause him to be both similar to and different from all other persons. The following brief survey of the various aspects of growth and development in the evolving individual is aimed at acquainting teachers and teacher trainees with some of the psychological factors in maturation and learning.

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THE NATURE OF GROWTH AND DEVELOPMENT

A CHILD may begin his formal education on the nursery school level at the age of two or three years. The start of his schooling may be delayed until he is six or seven years old. No matter what his age, the personal characteristics and habits that he brings with him to the schoolroom are likely to have a significant effect upon the degree of success that he attains during his school life.

Nature and *nurture* are common terms used to explain an individual's physical, mental, and emotional characteristics at any stage of his development. The extent to which a person is born to be the kind of individual that he is or the degree to which he has been affected by environmental influences has been and still is the subject of much study and discussion. The truth probably lies between the two extremes. A person is neither "born" to be nor "made" what he is. Rather is he the product of the integration of biological inheritance and social heritage.

THE DEVELOPMENTAL PATTERN

In the past it was believed that heredity and environment were two separate factors, each influencing in its own way an individual's personality and power to achieve. More and more we are coming to realize that what a person thinks, does, or feels as a child, adolescent, or adult results from the interrelationship that exists between biologically inherited factors and environmental influences.

The newborn infant is the product of two family lines. From

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the moment of conception onward, the new life continues to come under the influence of many and varied environmental stimuli. Each of these stimuli, separately and in conjunction with other stimuli, helps to mold the potentialities of human development and behavior which are inherited from one's forebears. Thus is formed a pattern of behavior characteristics that eventually comes to identify one as an individual — both like and unlike all other individuals. The interdependence of hereditary and environmental influences is described by Jennings in the following statement:

That which is directly inherited, in the way that property is inherited, that which is passed bodily from parent to offspring — is the set of genes, with the accompanying cytoplasm: — certain substances in certain combinations, which, under certain conditions, give rise to the individual, having certain later characteristics. With the same set of genes, different environmental conditions may induce the production of diverse characteristics. . . . There is then no thoroughgoing distinction in kind between diversities producible by gene differences and those producible by environmental differences. Characteristics do not fall into two mutually exclusive classes, one hereditary, the other environmental.[1]

The emerging individual. An infant inherits a biological structure. From the beginning of its existence the complex organism contains many genes or separate determiners of personal characteristics. As these interact with one another, with the cytoplasm, with environmental forces, growth or development is induced, and a *person* having distinguishing characteristics gradually emerges. It is this person who, at a relatively early stage in his development, becomes a pupil in the schoolroom. His teacher cannot change the child's hereditary nature. The best that he can do for the young person is to understand something of the bases of the child's being.

On the foundation of this understanding can be built an environment for the child that shall stimulate the development of whatever potentialities he possesses, and shall bring about whatever changes are desirable in his habits and attitudes

[1] Reprinted from *The Biological Basis of Human Nature*, p. 133, by H. S. Jennings, by permission of W. W. Norton & Company, Inc., New York. Copyright, 1930, by the publishers.

Thus the child is helped by the teacher to utilize native capacity in the achievement of desirable growth and development.

Some potentialities of development. It is self-evident that a child is not born fully equipped by nature with patterns of walking, talking, feeling, thinking, or experiencing. These forms of human activities must be learned. There probably are no "native" interests, but certain potential urges or impulses form the bases of whatever interests are developed by the child in terms of the environment in which he grows. Americans are not "natural" baseball fans. A long period of exposure to a sport that began many generations ago as a form of organized play has resulted in general acceptance by young and old, males and females, of baseball as the great American sport. However, this basic urge to enjoy sport may cause the national sport of another country to be soccer, for example.

The child does not come into this world knowing what is meant by terms such as *socially accepted behavior* and *cooperation with one's fellows.* These he must learn. Unfortunately, too many individuals seem unwilling or unable to develop those attitudes toward society that appear to be of greatest benefit to the individual himself and to the society of which he is a member. Education is effective only if and when the educand, at any stage of his learning, has been guided toward the most desirable development possible of his native capacity to achieve.

HEREDITARY FACTORS

Basic principles. Biological inheritance progresses according to certain definite principles as traits or characteristics are transmitted from one generation to another. These principles can be stated briefly as follows:

1. The bases of heredity are the germ cells, not the somatic or body cells. *Potentialities* of development, not acquired skills, knowledges, and attitudes, are handed down from parents to their offspring. Parental accumulations of learned activities are learned by the child to the extent that the latter inherits from the family line the capacity to profit from instruction.

A mother who may have achieved curly hair by way of attendance at a beauty shop cannot transmit the acquired curl in her hair to her daughter. The son of a skillful carpenter may himself become a skilled worker in his father's vocation

only if he inherits whatever potentialities are needed for the development of the skill and is stimulated toward engaging in the kind of training which will ensure for him competence equal to or superior to that of his father.

. Many examples could be cited by men and women who work closely with young people that would confirm the truth of this principle. Whatever continuity of progress one may expect can be achieved only to the extent that there is resemblance between parents and their children through the functioning of the germ plasm. Each generation must start afresh to build behavior patterns that, as they are improved through progressively more effective educational techniques, lead the way toward the realization of progressively more effective forms of civilization.

2. Human beings tend to be alike rather than different. This principle of conformity of the human species permits us to expect that the normal offspring of normal human beings will inherit certain structural and other characteristics that are regarded as human. More than that, although there may be some slight variations, a newborn baby inherits those traits and characteristics that are common to the family lines of which he is a product.

The theory of inheritance based upon the genes is generally accepted by students of biology or general psychology. The implications for the teacher of the principle of conformity are significant. A child is not the offspring of one parent or even of two parents, but of the long line of ancestors which have preceded the child's parents. Hence, if the school is to give adequate guidance to a learner, the teacher not only should recognize those potentialities in the child that are common in the human race but should become as fully acquainted as possible with a child's potentialities of development as these are common to the particular family of which he is a member.

3. The third principle of heredity is inherent in the one referred to above. Variation as well as conformity is common to inherited patterns of potential behavior. We all tend to be alike; yet no two of us, with the possible exception of identical twins, resemble each other completely in physical structure, physiological functions, or behavior characteristics. Although much of the variation that is found among human beings can be explained in terms of the effect of environmental influences, a newborn baby possesses combinations of characteristics that

may cause him to become very different from either parent. At the same time he may possess traits that can be traced through the parents to members of earlier generations of the families represented by the parents themselves.

Teachers as well as parents need to be sensitive to the extent to which a child gives evidence of family-child resemblance rather than of direct parent-child similarity. Too often a younger child in a family is expected to exhibit the same potentialities that are possessed by an older child. A mother known to the writers kept a detailed diary of the developmental progress of her first child. After her second child was born she began to compare minutely the behavior responses of the younger child with those made by the older child at similar stages of development. Unfortunately, what this mother had learned in her courses in biology and psychology did not function in a practical situation. It happened that not only did the younger child develop more slowly in certain areas than did the older, but some of his behavior responses differed from what his mother thought they should be. This caused the mother grave concern. She feared that her young son was not making adequate adjustment. It was not until the youngsters were about six and four years respectively that she was willing to admit that her children were alike in many ways and that the differences between them were normal and desirable.

In spite of their professional training, teachers also make the same error. A member of a certain family has earned for himself in his school relationships a reputation for unusual ability in one field or another, has displayed certain learning difficulties, or has given evidence of a particular set of attitudes. A younger member of the same family, upon his entrance to the school attended by his older brother or sister, is expected by his teachers to possess characteristics similar to those of the older child. To the extent that the two children are alike in nature and have been exposed to similar out-of-school environmental influences, this expectation may be fulfilled. However, the two children may give evidence of marked variation from each other, a fact which is not recognized by the teacher. Hence the younger child is expected to live up to the reputation established by his older brother or sister, or it is assumed that he will display the same behavior traits. It is very difficult for this young person

to gain from others recognition of himself as a *person* having potentialities that may or may not be possessed by the older child.

4. The operation of the principle of filial regression is significant in teaching-learning situations. Heredity appears to operate in such a way that there is a tendency toward arriving at a mean or average in human inheritance. In other words, a child tends not so much to repeat the degree of parental potentiality of development in any one characteristic as more nearly to approach an accepted norm for the particular group of which he is a member. For example, children of tall parents tend to be taller than the average but not so tall as their parents. The offspring of especially talented parents can be expected to be less gifted than their parents, and, similarly, the children of less able parents probably will exceed parental ability.

This principle can be explained, as can the others, in terms of the action of the germ cells. A gifted person is fortunate in that he is the product of a combination of carriers or determiners that made it possible for him to inherit the special potentiality. His offspring may possess other combinations which may lead to different results. If we accept the principle of family resemblance, however, the chances are better that the offspring will inherit a specific characteristic to a greater degree than average if that degree of potentiality has been characteristic of both family lines for many generations. We do have families of superior musicians, painters, writers, or leaders in other areas.

There are two points, however, that parents and teachers need to remember: (1) Favorable environmental influences and specific training are required to develop a superior potentiality or to improve a weak one. (2) It is possible for a child to exceed the achievement of his parents or to fail to reach their degree of superiority. Parents and teachers must take care not to attempt to force a degree of achievement on the part of a child in any field just because there is "talent" in the family. Equally important is the fact that parents and teachers need ever to be on the alert for signs in a child of a special ability that has not been exhibited by parents or near relatives.

Processes of heredity. Observations of plants and lower animals have given biologists some knowledge concerning the mechanism of reproduction. Experimental procedures applied to humans have not yet seemed feasible. Humans breed slowly.

Moreover, the complex arrangement of the large number of human chromosomes makes any prediction of possible combinations or blendings practically impossible.

A new life begins when the female germ cell or ovum unites with the male germ cell or sperm. Chromosomes (cellular structures isolated by biologists) form the bases of heredity. These chromosomes or strings of pairs of protoplasmic substances are believed to carry invisible elements, or genes, which act as determiners of possible characteristics. (See Figure 1.)

FIGURE 1. *Chromosomes in Elongated Threadlike Form Showing Genes Arranged in Linear Order*

From L. P. Thorpe, *Child Psychology and Development*. Copyright, 1946, by the Ronald Press Company. (After Shull.)

According to biologists, each individual possesses twenty-four pairs of chromosomes or forty-eight chromosomes in all. Fifty per cent of these have come to the individual from the maternal line and the other fifty per cent from the paternal line. The number of possible combinations of these determiners of heredity is legion.

Certain human characteristics remain relatively constant from generation to generation. However, the variation of combinations of a human's twenty-four pairs of chromosomes may result in possible permutations and combinations among humans that extend beyond the billions in number. The effect of direct biological inheritance referred to as *gene* or *germinal inheritance* is a significant factor in individual differences. Concerning this Jennings has said: "The way diverse individuals develop, the peculiarities that they show, the so-called laws of heredity, the extraordinary resemblances and differences between parents and offspring—all these things depend

FIGURE 2. *Schematic Illustration of the Arrangement of the Genes, or Bead-Shaped Bodies, on the Stringlike Chromosomes*

As indicated, one string of the pair comes from the father and one from the mother. The genes portrayed as being white are defective; those shown in black are healthy (normal).

From L. P. Thorpe, *Child Psychology and Development*. Copyright, 1946, by The Ronald Press Company.

largely on the arrangement and behavior of the genes."[2] (See Figure 2.)

The process or mechanism of fertilization is presented simply in Figure 3. Any newly fertilized ovum contains in its chromosomal nucleus all the characteristics or determiners that can be passed on to the new organism. Following the union of the male and female germ cells the process of mitosis or cell reproduction begins. During this process an equal number of chromosomes from each parent is received by each new cell. The process of cell division continues rapidly until the appropriate body structures appear. The individual develops as a result of the consistent division of chromosomes and the arrangement of genes that tend to be different for every individual.

It is difficult to arrive at any workable conclusions concerning the biological factors of heredity in the human being because of the effect of the continuous forces of the environment that consistently affect a new life shortly after conception. These environmental forces operate during the prenatal period and are extremely active from the time of birth onward. In no other form of life does the parent organism so deliberately and so early set up environmental conditions that shall direct the development of the newborn individual, and in no other form of life are the young so easily conditioned to environmental stimuli.

NATURE OF HUMAN GROWTH

Continuity of growth. From the beginning of a new life onward growth is continuous. So common is this phenomenon that teachers as well as parents may come to take the growth of a child for granted. During a child's earlier years it is true that parents perhaps overemphasize the incidence of outward signs of development. The first word spoken by the baby or his first step becomes a matter of great rejoicing in the family. Concerned as an adult may be over the immediate evidences of growth, greater concern should be experienced over the direction that will be taken by any one of the many specific growth patterns that are developing within the child.

The teacher in the classroom and the parent in the home need to keep one jump ahead of the developing child. Figura-

2 From H. S. Jennings, "How Heredity Affects Personality," *Parents' Magazine*, 6:3 (1931).
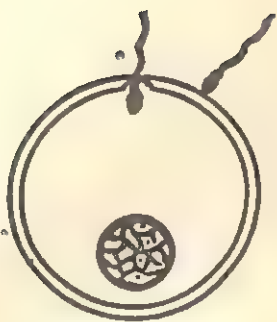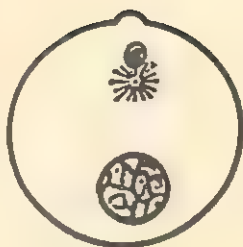
Entry of Sperm   **Loss of Sperm Tail**   **Division of Centrosome**
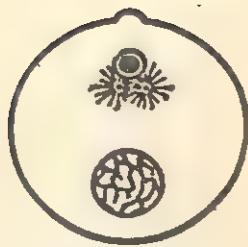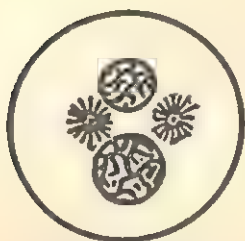
Approach of Sperm Nucleus   **Increase of Sperm Nucleus**   **Formation of Chromosomes**
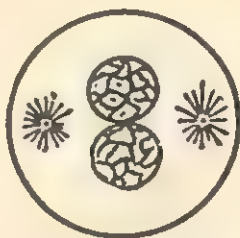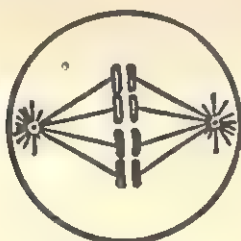
Splitting of Chromosomes   **Anaphase**
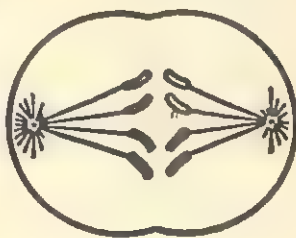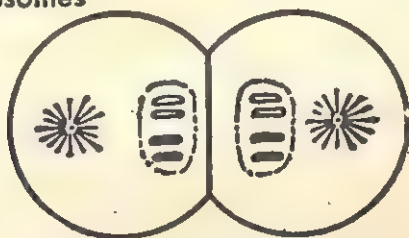
Two-celled Stage

FIGURE 3. *The Process of Fertilization*

Paternal chromosomes are represented as black; maternal chromosomes as white

From H. E. Walter, *Genetics*, p. 186. By permission of The Macmillan Company, publishers.

tively, the youngster has taken his first step. The adult must be ready to guide all the succeeding steps that will be attempted by the growing individual so that they will become increasingly successful as the process of growth continues.

Prenatal development. In the past, relatively little attention was given by educators to the prenatal period of development. Normally, the prenatal environment does not give evidence of the amount and kind of variation characteristic of the environment into which the newborn infant enters and by which he continues to be stimulated from birth onward. Moreover, reliable data cannot easily be obtained concerning the influence upon the new life of the sheltered environment of the mother's body. It is well for a teacher and a parent to realize, however, that those characteristics which a child later may display can be traced partially at least to the effect of prenatal influences upon his growing structure and cannot be considered entirely the result of "original" nature.

During the prenatal period the human organism passes through three general stages: germinal, embryonic, fetal. The term *germinal* is applied to the egglike organization that exists for about two weeks after conception. By the eighth week of development (the embryonic stage), the structure displays definitely human characteristics. From the eighth week to birth (the fetal stage) the new life continues to develop human structure and organs. (See Figure 4.)

During the fetal stage the cells increase in number and in size. The nervous system that began to form a pattern during the embryonic stage now takes on a branching structure that increases in power to respond to stimulation. This growth goes far beyond the existing needs of the fetus and foreshadows the future learning ability of the organism. Gradually the growth of the nervous system in general is accompanied by the development of muscles and sensory centers. The development of response to stimulation on the part of the fetus follows the general line of structural development, which is from the head downward to the caudal or tail end.

Studies have shown that the child responds to stimulation during the prenatal period:[3] However, there is little evidence

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[3] See Catherine Landreth, *The Psychology of Early Childhood*, Chapter 2. Alfred A. Knopf, Inc., N. Y., 1958.

FIGURE. 4. *The Development of the Human Embryo*

Courtesy of the Cleveland Health Museum.

of truth in certain common beliefs that a pregnant woman can "mark" her unborn child as a result of unusual experiences, such as intense emotion-arousing situations. Conditions may prevail during the prenatal period that can influence the development of the organism. Such influences, resulting from environmental conditions rather than from native inheritance, are termed *congenital influences*. Some of the most important of these disturbing influences are listed by Schwesinger as follows:

.1. *Malnutrition.* Excessive malnutrition of the mother's organism during the intra-uterine period may deprive the growing child of essential nutritive elements. Such deprivation may hamper the child's physical development.

2. *Disease.* Mothers suffering from such wasting diseases as diabetes, cancer, tuberculosis, and pellagra are likely to affect their unborn

offspring adversely. Physical effects similar to those noted in malnutrition may be produced.

3. *Infection.* Infectious diseases, particularly syphilis, frequently attack the nervous system and may result in congenital weakness or instability. An apparently healthy mother may house germs that prey on her unborn child.

4. *Toxins.* The developing child may be affected by toxic poisons that seep through blood vessel walls into the umbilical cord. It was formerly believed that alcohol could affect sex cells before conception, but this belief has been largely discredited.

5. *Endocrine imbalance.* A deficiency or excess of endocrine secretion in the mother may seriously hamper the physical and mental development of an offspring. It is well known that cretinism, a disorder marked by general retardation and emotional and mental subnormality, may be caused by a deficiency of the thyroid hormone.

6. *Birth injuries.* Injuries resulting from the use of obstetrical instruments and pressure on the soft skull of a fetus during labor and delivery may result in arrested development, feeble-mindedness, cerebral palsy, or other abnormal tendencies. Various defects are sometimes erroneously assigned to this cause, but parents naturally prefer to avoid admissions of germinal weakness.

7. *Emotional shock.* It is possible that severe emotional shock may force an excess of the powerful adrenalin hormone into the blood stream going to the fetus (by osmosis). Whether such a process affects adversely the mentality and nervous stability of the developing child is a moot question. Little of a certain nature is known about this problem and it is thus best to suspend judgment regarding it.[4]

As continued study and experimentation yield more definite data concerning the effect of prenatal influences upon the organism from conception to birth, we may become better able to differentiate between what the newborn infant has inherited by way of the genes and what modifications of original nature have been experienced by him as a result of his uterine existence. Much prebirth maladjustment of her child can be avoided by the mother who understands the significance of her own habits and practices during pregnancy. Teachers can be helped better to guide young people if they appreciate the important part in the life of a child that is played by environmental influences before birth as well as throughout life from birth onward.

[4] From G. C. Schwesinger, *Heredity and Environment*, pp. 351–332 (1933). By permission of The Macmillan Company, publishers.

Postnatal growth. The successive periods of human life from birth to death usually are referred to as infancy, childhood, adolescence, maturity, and senescence. As these terms imply, it can be expected that growth and development will be continuous and more or less regular from infancy to maturity. Adulthood or maturity can be regarded as the period of life during which the individual can utilize whatever powers and strengths he has achieved during his earlier stages of development. The senescent period is marked by a gradual losing of the full strength of maturity and a decline in power to achieve.

Development from infancy through pre-adult life is irregular in pattern but continuous. There are no sharply defined lines of demarcation between infancy and childhood, childhood and adolescence, adolescence and adulthood. Moreover, development should not be regarded as an all-inclusive term describing complete progress from infancy to maturity. The individual's growth is partly a natural consequence of his being a living organism. Both in structure and in function a child grows in strength and power. Ability to sit up without assistance, growth of sensory acuity, and power of articulation are results of the process of *maturation*. This natural pattern of development is important. Parents and teachers must have an understanding of the optimum time for the beginning of training in this or that activity. A child should neither be forced beyond his existing stage of maturation, nor denied appropriate stimulation toward activity when he is ready to benefit from such stimulation.

Coordinate with and dependent upon the individual's stages of maturation comes the learning that he experiences as he is influenced by the environmental factors to which he is exposed. The conscious and unconscious training which the individual undergoes at home, in the school, or in any other situation furthers the development of his natural potentialities.

Formerly, chronological age was accepted as the determinant of readiness to engage in formal education. Children were admitted to the first grade of the elementary school at six years of age and were expected to progress successfully, year-by-year, unless they were lazy. School people now recognize the integrated nature of maturation and learning. Children of the same chronological age differ in their degree of readiness to

adapt to particular environmental stimuli. The kind, rate, and expressional form of developing adaptations are dependent on learning or the modifying influence of appropriate stimuli.[5]

Reference has been made to the fact that, although growth is continuous, it is not regular. Unevenness of growth is indicated by the fact that degree of maturity may not be the same in several traits at a particular age. Hollingworth presents the following data (Table I) as illustrative of the irregularity of growth in several traits.

TABLE I.   *Developmental Status of 10-Year-Old Child*

TRAIT	PER CENT OF 18-YEAR STATUS
Strength of grip	37
Weight of the body	48
Sensitiveness to pain	65
Stature (standing)	78
Rate of tapping	82
Size of skull	96

From H. L. Hollingworth, *Educational Psychology*, p. 111. Copyright, 1933, by D. Appleton-Century Company.

It is not uncommon to find teachers who do not recognize the fact that there may be unevenness of growth among the traits of a developing child. In another book the authors make the following statements:

"An individual's personality does not consist of a single functioning entity but is composed of a complex of many traits or characteristics that are more or less integrated. These personality components do not always parallel one another in their rate and extent of development. Consequently, at any stage of development there may be differing degrees of maturity among the various traits. These differing patterns of growth often are referred to as stages of development, or 'ages.' Usually included in these 'ages,' especially for educational purposes, are the following:

[5] See G. M. Blair, *et al.*, *Educational Psychology*, p. 140. Copyright, 1954, The Macmillan Company.

1. Chronological age
2. Physiological age
3. Anatomical age
4. Mental age

5. Educational age
6. Emotional age
7. Social age
8. Moral or religious age

"Any person who is concerned with the education of an individual at whatever age must recognize the presence of and the rate of development of each of these various areas of human growth. School men and women must take cognizance not only of the fact that the potential learner consists of brain or even of 'brain and brawn' but of the fact that he is a complex of many phases of growth which may or may not follow the same or a similar rate of development." [6]

Rate of growth is individual for each child and for each trait of the child. There may be similarities among these rates, but they cannot and should not be taken for granted. It is not unusual, for example, for a teacher who has taught a child when the latter was about seven years of age to discover that at the age of twelve the child displays either a much greater or a much lower degree of mental alertness than was evidenced in younger years. Some children develop rapidly in one or another trait during their early years and then seem to reach a plateau. Others give indication of a gradual and relatively regular pattern of growth. Still others appear to be retarded during the early years and then to experience what seems to be a sudden spurt that may carry these young people beyond what might be considered normal for their maturity status. These possible variations in growth must be taken into consideration if curriculums and techniques of teaching are to be adjusted to the individual needs of learners.

In summary, certain general principles of growth as listed by Witherington are presented:

a. The effect of efforts to learn depends upon the degree of maturation attained.
b. Rate of growth is more rapid in the early years.
c. Each individual has his own rate of growth.
d. Each species follows a common general pattern of development.
e. Mental traits appear together rather than in serial order.

[6] From L. D. Crow and A. Crow, *Introduction to Education*, Revised Edition, pp. 129-130. American Book Company, New York, 1954.

    f. Heredity and environment are both essential to any growth.

    g. Growth may be retarded or accelerated.

    h. Growth involves both individuation and integration.

    i. Girls are generally more mature than boys at any given chronological age.[7]

Growth and education. The chief functions of the school usually are considered to be the inculcation of certain commonly used skills, such as reading, writing, and figuring; the mastery of information that is accepted as needed in one's daily life experiences; and the development of traits, such as industry, honesty, and cooperation. These areas of education are important. However, if education is to be completely functional, it must spread out to include all-round guidance of the learner in fitting him for successful participation in all phases of his present and future life relationships.

If education is to fulfill this broad and comprehensive objective, it is important that educators know that with which they start as well as that which they hope to achieve. If we accept the premise that to be successful learning must follow the learner's progressive and varying ability to benefit from instruction, it is necessary that teachers understand the developmental potentialities of each individual learner.

The bases upon which educational theory and practice are built include the patterns of physical, mental, emotional, and social development as well as the general psychological principles fundamental to growth and development in these four areas. In the following chapters, therefore, attention is directed to factors of growth and development that need to be understood and applied if education is to become a truly integrated process.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Suggest ways in which an understanding of the psychology of learning can be helpful to teachers.

2. What observations have you made concerning the effectiveness of your teachers?

3. List and discuss the reasons why teachers attempt to motivate learners.

[7] From H. C. Witherington, *Educational Psychology,* p. 110. Copyright, 1952, by Ginn and Company.

4. What do you consider to be the greatest responsibility of a teacher? Explain.
5. What do you consider to be the responsibility of a teacher in the development of proper attitudes?
6. To what extent should a teacher be interested in people?
7. Of what importance to a teacher is his understanding of the behavior of others?
8. To what extent and in what ways should a teacher influence the behavior of others?
9. Make a list of all of the characteristics of a teacher you had in elementary school or high school which convinced you that he was a superior teacher. Do the same for the poorest teacher. What differences do you find?
10. Enumerate the values associated with teaching.
11. What special contributions do you expect to make as a teacher?

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4

PHYSICAL GROWTH AND DEVELOPMENT

The individual as an active, productive member of his group is first and foremost a *physical* being. Consequently, any program of learning that is organized for his benefit must not only be geared to his progressive stages of physical growth but also be aimed at providing educational media that will make possible for him the development of excellent body symmetry, good health, and effective activity of the neuromuscular system that will help him live long and successfully.

GENERAL CHARACTERISTICS OF PHYSICAL DEVELOPMENT

Growth versus development. Fundamental to the degree to which any individual shall achieve success and satisfaction in his life relationships as child, adolescent, or adult is his pattern of physical growth and development. In this connection, we generally apply the term *growth* to those structural and physiological changes that take place within the individual during the process of maturation. One characteristic of human life is the probability that there will be a progressive change in bone, muscular, nervous, and glandular structures.

Natural growth is helped or hindered by the environmental factors which stimulate the growing organism. Among these factors are heat, cold, light, diet, family health history, economic status, and experiences that influence both the physical and the emotional patterns of the growing organism. The physical development of the individual is conditioned by both nature

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and nurture. Some of the biological and environmental factors that influence the rate and kind of a child's growth progress are:

1. Inherited potential
2. Physical and health status of parents at time of conception
3. Health of mother during pregnancy
4. Conditions of prenatal growth
5. Absence or presence of birth trauma
6. Care of nutritional and other body needs
7. Relation of active exercise to relaxation, rest, and sleep
8. Presence or absence of physical defects
9. Preventive and therapeutic medical attention
10. Cultural or subcultural living conditions

Importance of physical development. Reference has been made earlier to the fact that, although human development in general shows a high degree of consistency, there exist wide differences among individuals in the rate and direction of growth of various characteristics. Teachers need to be alert to these differences among their pupils as well as to the to-be-expected similarities. The child whose physical development is slow or retarded cannot be treated in the same way as the child who appears to be following a relatively "normal" pattern of growth. The young person who seems to be physically developed beyond his years also needs special consideration. His power to achieve in learning areas should not be overrated because of his apparently superior degree of physical maturity.

Attitudes, interests, and emotional behavior often grow out of physical status. Adults sometimes fail to recognize the importance to a child of his physical appearance. The young child may become aware of the fact that he differs in appearance from other children. Unless there is a marked deviation from so-called normal physical status, the child and his young peers tend to disregard an individual peculiarity. During later childhood and adolescence, however, even a slight or temporary physical abnormality can exert a tremendous influence upon a young person's emotional reactions.[1]

The growth pattern varies among individuals and within a

[1] See L. P. Thorpe and W. W. Cruze, *Developmental Psychology*, pp. 90–92. Copyright, 1956, by The Ronald Press Company.

single individual. Differences in height, weight, and body contours influence young people in their interrelationships. The 12- or 13-year-old boy who is abnormally slight or large in comparison with the majority of his peer group may or may not be accepted by the others. The small lad is denied participation in strenuous sports enjoyed by his age associates. He may be nicknamed "Shorty"; same-age girls tend to prefer boys who are physically more developed or older than themselves.

Exceptional height, overweight, disproportionate largeness of hands or feet resulting from unevenness of physical growth rate, may cause an adolescent girl considerable embarrassment. Acne (facial eruptions) is another source of emotional disturbance among both boys and girls. Popularity among one's peers tends to become an increasing need of young people during later childhood and adolescence. Whether physical appearance is the primary or sole basis of peer acceptance or rejection is closely related to value judgments often acquired through imitation.[2]

The study of physical patterns of growth is important. Knowledge of what can be expected in the way of normal growth and development provides a basis for the construction of curriculums, the evolvement of techniques of teaching, and the utilization of learning equipment. To the extent that deviations from the norm of physical growth show themselves, the teacher must be prepared to meet them. He must be able to make whatever adaptations of normal learning and living situations will help the deviate to approach as nearly as possible the norm for his stage of physical development and to adjust emotionally to those phases of growth that may be termed abnormal. Only the child who has "shot up like a weed" knows what it means to sit in a school seat of "normal" size!

Methods of studying physical growth and development. The measurement of physical growth can be approached either horizontally or longitudinally. Most studies have been confined almost entirely to the gathering of data concerning growth patterns of large groups of children at specific stages of development. Such attempts at cross-sectional or horizontal measurement have resulted in the formulation of conclusions concerning

[2] See L. J. Cronbach, *Educational Psychology*, pp. 76–79. Copyright, 1954, by Harcourt, Brace and Company.

growth tendencies within the two sexes and among racial groups or national populations.

More recently research workers in the field of developmental psychology have placed greater emphasis upon what can be referred to as longitudinal measurement. Horizontal measurement yields data concerning general tendencies of large groups but often fails to give indication of *individual* growth patterns. A progressive study of an individual's yearly developmental changes can be used to compare the individual with himself at various stages of his growth as well as to show the relation of his growth progress to that of other members of his group.

Studies of child development have been conducted by child research agencies established in many colleges and universities, including Harvard, Yale, Michigan, Iowa, and California. Data also have been accumulated by children's clinics, special groups, and individual research workers. There are many examples of intensive and extensive study in this field. Preyer's *Mind of the Child* (1882) is one of the first well-known pieces of work. G. Stanley Hall is famous for his arousal of interest in genetic studies. Carl Murchison's *Handbook of Child Psychology* contains interesting data concerning the developmental pattern of physical growth. Arnold Gesell's studies (both horizontal and longitudinal) have given us much valuable data.[3]

General results of studies. Some of these studies covered long periods of development and resulted in definite conclusions concerning lines of growth. The twelve-year Harvard Growth Study is one of these. According to the results of this study, growth is rapid from birth until about the age of two. From this time on there is a decrease in the rate until several years before puberty, at which time there is another rise in rate that continues to puberty. After puberty, growth seems to be slower but is continuous until the age of seventeen or eighteen. The curves[4] for both sexes are relatively similar, except for an adolescent spurt that gives the advantage to girls over boys.

According to Courtis the longitudinal measurement of growth

[3] For further study of these methods see "Selected References" at the end of this chapter.

[4] See W. F. Dearborn and J. W. M. Rothney, *Predicting the Child's Development*, Sci-Art Publishers, Cambridge, Mass., 1941. Also J. W. M. Rothney, "Recent Findings in the Studies of the Physical Growth of Children," *Journal of Educational Research*, 35:161–182 (1941).

appears to give evidence of four cycles. The determination of these cycles rests in part upon the rates of ossification of the bone structure, growth in height and weight, and development of other personal characteristics, interests, and capacity for learning. These cycles can be differentiated as follows:

1. The *prenatal*, during which development proceeds *in utero* as in the case of animals who live in water.

2. *Infancy* (on the average from birth to five or six years of age), during which the sensory channels begin to function and the child learns to creep, walk, and speak.

3. *Childhood* (on the average from five to twelve), during which permanent teeth appear, the child learns to read, write, and care for himself, and marked changes in personality take place.

4. *Adolescence* (on the average from twelve to eighteen), during which the development of sex organs brings about the appearance of physical sex characteristics.[5]

SPECIFIC GROWTH CHANGES

Height and weight. The results of studies of growth would seem to indicate that normal children tend to follow certain definite patterns of rapid height-weight increases during their infancy. Thorpe summarizes the results of these findings thus:

. . . according to a recent study, the average birth weight regardless of race or sex is 7.13 pounds. In this case male infants weighed, on the average, 0.2 pounds more than female newborn. White newborn infants weighed 0.25 pounds more than Negro infants, but socioeconomic status exerted no effect on the birth weight of the child. An earlier investigation showed that 85 per cent of the newborn weigh between 6 and 9 pounds and vary between 17 and 22 inches in height. An idea of the rapidity with which the infant grows may be gained from the facts that infant boys grow, on the average, $7\frac{1}{8}$ inches by the age of nine months, and that infant girls grow $6\frac{3}{4}$ inches by the time they have reached the same age. Even more marked is the infant's increase in weight, which is doubled by the average child during the first six months. By the time the average boy has reached a height of $28\frac{1}{4}$ inches, his weight has increased to $19\frac{11}{16}$ pounds. The average baby girl of $28\frac{1}{4}$ inches will have attained a weight of $19\frac{5}{16}$ pounds.[6]

[5] From S. A. Courtis, "Maturation as a Factor in Educational Diagnosis," in *Educational Diagnosis, Thirty-Fourth Yearbook, National Society for the Study of Education*, 1935, pp. 177–178. By permission of the Society.

[6] From L. P. Thorpe, *Child Psychology and Development*, Second Edition, p. 102. Copyright, 1955, by The Ronald Press Company.
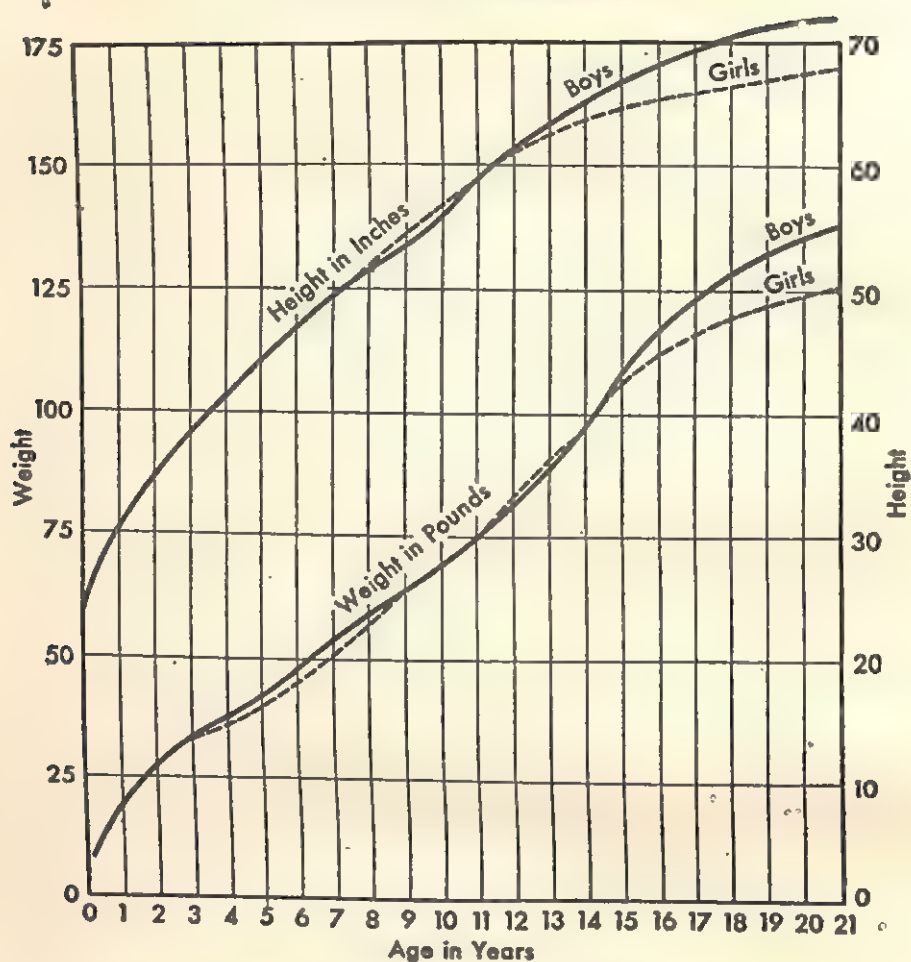
FIGURE 5. *Age Changes in Height and Weight*

From A. R. Gilliland. *Genetic Psychology*, p. 149. Copyright, 1933, by The Ronald Press Company. (Graphs, based on summary of data from the records of Baldwin, Boas, Crum, Smedley, and others.)

During childhood and adolescence an individual increases in stature. As the result of the measurement of large numbers of individuals at successive ages, it is possible to generalize concerning average tendencies in growth. Figure 5 illustrates the direction that these changes may be expected to take.

Average trends in height and weight cannot be regarded, however, as applying to any one individual, since wide variations can be found among growing children. The norms for any given age are no more than guides in the examination of the height-weight ratio of a particular child. Hereditary background

3 Mo. Fetus   Birth   2 Years   6 Years   15 Years   25 Years
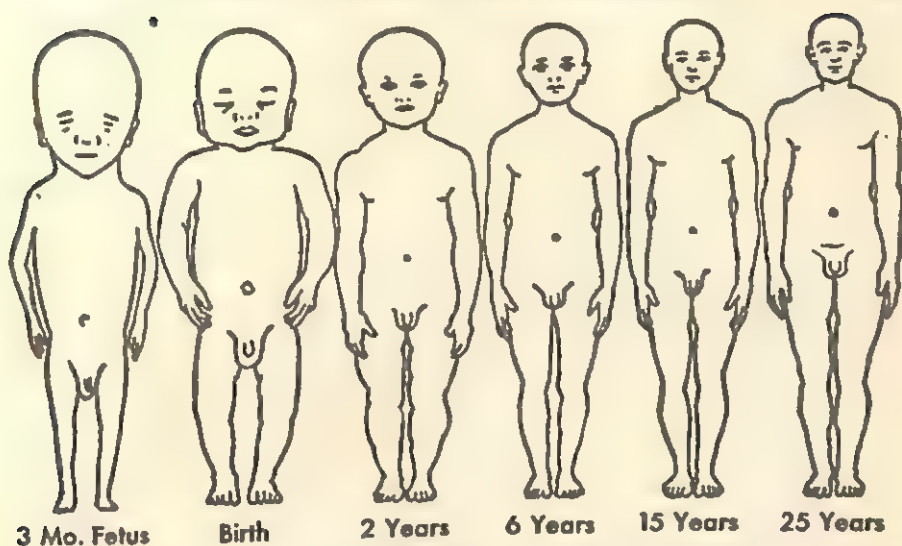
FIGURE 6. *Changes in Body Proportion, Fetus to Maturity*

From H. C. Stuart, *Healthy Childhood*, p. 55. Copyright, 1933, by D. Appleton-Century Company. (From drawings by Scammon, Calkins, and Stratz.)

must be considered. A child may be the product of a family that tends to be short and stocky, tall and slender, underweight or overweight. Environmental factors (especially diet) also influence the anatomical development of the young person.

Relative height and weight are important only in so far as they (1) are indicative of good physical health, and (2) do not deviate from the accepted norm to so great an extent that the child suffers emotional upsets from comparison with more nearly normal children of his own age group.

Body proportions. The growth of the skeleton is not regular for all of its component parts. For example, since fetal development is from the top downward, the size of the skull of a newborn infant is relatively much larger than are the bones of the arms and legs. As the individual matures, the head and torso become proportionately smaller and the arms and legs increase in length. This difference in rate of growth of the various parts of the human body is illustrated in Figure 6.

In connection with skeletal growth, reference also can be made to dentition. At birth there is an absence of teeth. Gradually the child's first set of teeth or the "baby" teeth appear. As growth of the body increases, these give place during childhood to a second set of teeth that, with proper care and the

eating of healthful food, should serve the individual throughout his life.

Growth of the internal organs. From birth onward changes take place in all of the body systems — digestive, respiratory, muscular, nervous, circulatory, lymphatic, reproductive, and glandular. Body systems develop at different rates, thus making possible the internal "equilibrium of bodily life."

At birth the nervous system already has developed to the extent that it can respond in terms of further growth to the stimulation of environmental conditions, and can make possible the child's adjustment to these environmental influences. The muscles that control skeletal movements increase in weight from about one-fifth of the total weight of the body to one-third in adolescence, and as much as two-fifths at maturity.

There is no evidence of breathing during the prenatal stages of life. With the infant's first breath (his first independent action) impetus is given for the balanced functioning of the circulatory system. In its embryonic stage, the beat of the heart is frequent but feeble. After birth, respiration causes the heart to beat more strongly and more slowly than it did during the prenatal period. As the heart grows in size, there is an increase in the steadiness of the heart beat as well as an increase in the blood pressure in the arteries. From a possible high of 140 heart beats during the first month of life, the rate decreases to about 100 heart beats at the age of about six years. The rate is reduced further to about 85 beats in a twelve-year-old child. The normal rate for an adult is approximately 72 beats per minute.

The lymphatic system is active in the elimination of wastes and the destruction of bacteria in the body. This system increases rapidly until about the twelfth year, at which time it decreases rapidly. Contrariwise, the genital organs, which develop slowly during early childhood, start to grow rapidly as the individual approaches the age of eleven or twelve.

ENVIRONMENTAL INFLUENCES AND PHYSICAL DEVELOPMENT

The human body is a complex mechanism. The interrelationships that exist among all of its parts in their processes of maturation are not yet fully understood. However, the results of research studies cannot fail to convince us that healthy growth

is closely allied to favorable living conditions. Factors such as poorly planned or unplanned recreation and rest, improper diet, badly ventilated living quarters, as well as deficient inheritance (biological and social), are conducive to stunted growth or underdevelopment.

Malnutrition is an evil of society that is receiving increased attention in most American communities. According to recent findings, many people in the United States are still undernourished, have inadequate shelter, and lack other life necessities.

Lack of food or unhealthful diet is not the only cause of malnutrition. Included among contributing factors are emotionally disturbing home or school conditions and other stress-producing neighborhood situations. Hence the increasing number of behavior problems among our young people well may reflect the influence of both physical and psychological deprivation.[7]

Attention is being given to ways of counteracting the effects upon children of malnutrition. A national school lunch program has been instituted to provide for those who need a well-balanced hot lunch each school day. All children are encouraged to eat three meals every day at regular hours. Growing boys and girls should have a breakfast (fruit juice, milk, and cereal), a hot lunch, and a well-balanced evening meal. Adult application of mental hygiene principles with children is also an extremely important emotion stabilizer.

If we are to achieve an American citizenry that possesses strong, well-built bodies and healthy constitutions, we shall need to become increasingly concerned with the physical growth and development of our children. It is the right of every child to be well born — to be the offspring of parents who themselves are healthy and well-balanced individuals. Furthermore, healthy physical growth is conditioned by the extent to which a child is provided with sanitary conditions of living, proper diet, sufficient and well-planned exercise and rest, periodic medical examination and care, and nondisturbing emotional experiences. In this connection, it is a noteworthy fact that the schools of our country are assuming an increasing amount of responsibility for the provision of life necessities.

[7] See L. Peck, *Child Psychology*, pp. 264–265. Copyright, 1953, D. C. Heath and Company.

EDUCATIONAL SIGNIFICANCE OF PHYSICAL DEVELOPMENT

Children are not adults in miniature. This is a fact that should be basic to the setting up of educational programs on any level. Perhaps it is in the activities provided by the modern school curriculum for younger children that we find the greatest recognition of a proper relation between stages of physical growth and school procedures. Lower school practices have gone a long way in attempts to meet the young child's physical needs. There are few schools in which youngsters are expected to sit for long hours in uncomfortable seats. Physical activity as well as mental is stressed. Teachers of young children are becoming increasingly alert to the value of preventing physical disorders and recognizing physical defects. Provision is made in most elementary schools for the meeting of nutritional lacks. Play and exercise are adjusted to the physical needs and capabilities of the growing younger child.

Much more attention still needs to be given, however, to the physical and physiological status of the older child and of the adult. The important and rapid changes that take place in the physical constitution during the prepubertal, pubertal, and postpubertal periods are not always recognized by educators or provided for by them. The individual's physical needs, the relationship that exists between his "growing up" and emotional adjustment, and his changing attitudes toward his own physical growth which accompany the years between early childhood and the attainment of adult maturity give rise to many problems. These problems cannot be ignored by the school. Constant and consistent attention must be given by teachers and other school personnel to the growth pattern of every individual young person. In the name of good physical development, mass schooling must give way to a consideration of individual needs.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Distinguish between growth and development. Illustrate.
2. Cite examples of cases in which environmental influences (*a*) hindered physical growth, (*b*) helped physical growth.
3. Differentiate between longitudinal and horizontal methods of studying physical development. Evaluate each method in terms of its contributions.

4. What is needed to ensure that a child shall be "well born"?
5. Defend the thesis that a child is not an adult in miniature.
6. Explain the relationship between physical status and emotional behavior. Cite examples from your own experience.
7. What physical conditions might cause a young person to be embarrassed among children of his own age?
8. Do you agree with Courtis that growth appears to give evidence of four cycles? Substantiate your opinion.
9. Trace changes in body proportions from the prenatal period to adulthood.
10. Recall your elementary school experiences. List ways in which provision was made in your school for physical improvement.
11. What specific improvements are needed in school procedures to provide ways of helping the physical development of adolescents?
12. Discuss this statement: "Schools should assume responsibility for providing nourishing food for children who need it."
13. Show by examples that children may be forced to engage in activities for which they are not yet physically ready.
14. What are the educational implications of the early development of the nervous system?
15. Describe what you would consider to be an optimum environment for a child's physical development.

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5

MENTAL GROWTH AND DEVELOPMENT

"MIND and body" is a phrase one often hears in general conversation. Implied in it is a belief that a person's mind or *mental self* is a distinct entity, having little if any connection with his body or *physical self*. An interpretation of the mind and the body as two coexisting entities rather than as components of an integrated whole may have its basis in the fact that the body is ever present to the senses — we can see it and touch it. The existence of the mind, on the contrary, can be recognized only through its functioning in the observable behavior of an individual as this behavior is seemingly controlled in some mysterious fashion from within.

Physical growth can be measured from the prenatal period onward. Mental growth defies objective measurement of the kind that can be applied in the study of bodily growth. Hence available data are relatively incomplete concerning such questions as: What is included in the term "mental traits"? What is the relationship between mental growth and physical growth? Are mental traits inherited? What do we know about the development of mental ability?

PHYSICAL BASES OF MENTAL DEVELOPMENT

Physical versus mental. As was noted in the preceding chapter, physical growth refers to structural changes in an organism which are evidenced by increases in height and weight, and by adaptation of body organs to increasing body needs. Mental growth refers more definitely to growth in ability to

adapt behavior to environmental conditions as the organism strives to achieve increasingly conscious goals or purposes.

From infancy to adulthood there appears to be a relationship in the extent to which physical and mental growth increases with chronological age. In general, three-year-olds are physically and mentally more mature than one-year-olds. The same growth progress is evidenced as the child reaches his seventh, tenth, and succeeding years through adolescence. Thus there appears to be a high correlation between physical and mental growth as measured on the basis of chronological age.

A cross-sectional study of children of any given age, however, would show that both the physical ages and the mental ages of a large group of children of the same chronological age give indication of great variation within themselves and between the two. Among seven-year-olds, for example, physical growth status may range from extreme underdevelopment to exceptional overdevelopment, especially in height and weight. Similar variations can be found among seven-year-olds in their relative degree of mental ability, ranging from very low mental status to superior mental acuity. Nor do the variations in physical and mental growth parallel each other. Youngsters who are well developed physically may be much below the norm mentally. The opposite also is true. However, contrary to popular belief, mentally superior children tend more often than not also to be physically well developed. In general, though, there appears to be no guarantee that a child at any given chronological age will have reached "normal" stage of growth either physically or mentally.

Brain growth and mental development. Mental activity can be interpreted as pertaining to the functioning of the brain and the nervous system. Hence neurological growth and mental growth are related one to the other. The growth and development of the brain and the development of mental ability are factors to be considered by educators as they plan educational procedures.

At birth, the weight of the brain in relation to total body weight is greater than it will be at any other time during the process of body growth. This does not mean, however, that the newborn infant's brain has reached its complete development
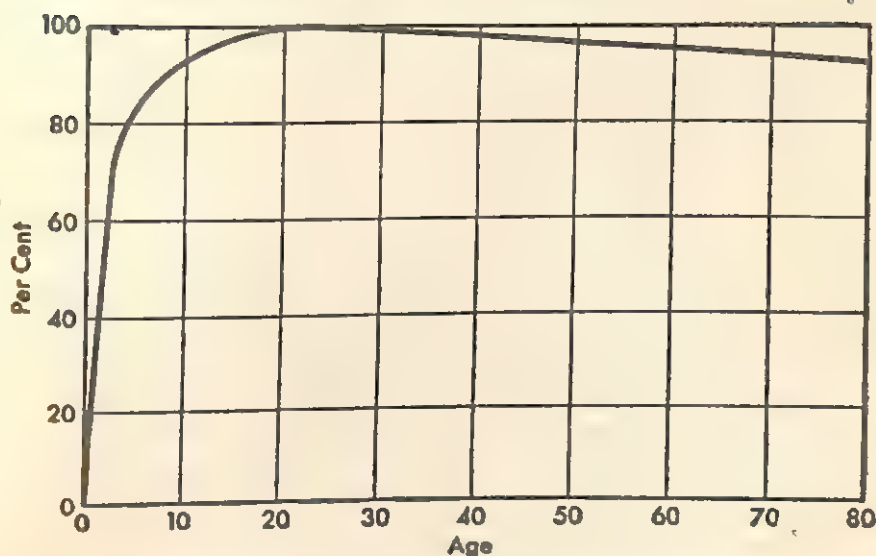
FIGURE 7. *Weight of the Brain from Birth to Old Age*

and that the nervous system is ready to function as well at that time as it will later.

In Figure 7 are presented the rate and amount of brain growth from birth to maturity and the slight decline that may be expected during the later years of life. It can be observed that the rate of growth is greatest during the early years of childhood. As the child approaches his fifth year the weight of the brain is about eighty per cent of its maximum weight. By the ninth year this percentage has increased to ninety per cent. Maximum brain development can be expected to be attained shortly after the individual has reached his twentieth birthday. Significant changes in mental ability accompany these changes in brain weight.

Brain cells grow until maturity, although their actual number is fixed during the prenatal period.

The outer layer or *cortex* of the cerebrum and not the entire brain, including arteries, veins, and fatty substance, controls mental activity. The cortex consists of three layers — the *infra-granular*, the *granular*, and the *supragranular*. The infragranular layer, which has reached about eighty per cent of its growth at birth, is connected most directly with reflexes and so-called

instinctive responses, such as eye-blinking and knee-jerking. The granular layer (reaching seventy-five per cent of its growth at birth) has to do with the conduction of sense impressions. The supragranular layer, which bears the closest relation to degree of mental ability, has reached no more than fifty per cent of its growth at birth.

From the differing stages of growth at birth of these three layers, each having its special function and its specific influence upon the mental development of the child, certain inferences can be made. Survival is assured the child by his power as an infant to engage in reflex and related responses. Then his sensory mechanisms develop as aids in acquainting him with his environment. Lastly, he achieves the ability to engage in simple mental activity, and, as he approaches full maturity, he develops capacity for abstract thinking.

Educational implications. The rate and the limit of growth of the cortical areas vary with individuals. In the feeble-minded the supragranular layer of the cortex shows retarded development. In the "bright" this layer develops rapidly and fully. However, no matter how rapid or how much retarded the growth of the cortex may be or at what point development may cease, the three layers develop in the order given above.

Cortical growth is basic to the development of learning readiness. During his first years a child's learning should be concerned with the development of the body reflexes and simple responses. The development of sensation and of perception then should be stressed. Gradually, as the supragranular layer continues its pattern of development, the child can be introduced to more formal learning situations. Beginning with the mastery of simple symbols and relationships, there can be experienced further learning activities that increase in complexity and abstraction as the brain develops, with an accompanying increase in ability on the part of the child to profit from his up-stepped learning activities. The relationship that exists between continued growth and increase in learning readiness is evident to anyone who has followed a child's educational progress from kindergarten through the elementary school grades.

Although there is a relationship between brain growth and mental development which is important educationally, it should be noted that experimenters in animal psychology as well as

brain surgeons have some doubt concerning complete adherence to the structure-function theory of the inheritance of mental ability.[1] According to Kantor: "It is indeed unfortunate that psychological phenomena are still looked upon as general functions requiring some sort of neural substratum. This, no doubt, is only an exemplary illustration of the weighty influence of tradition upon our thinking." [2]

MENTAL ABILITY AND BIOLOGICAL INHERITANCE

Attitudes toward biological inheritance. Popular opinion concerning the causes of differences among individuals in degree of mental capacity tends to run to extremes. In the thinking of a great many people biological inheritance is almost the sole basis of an individual's mental status. Some people go so far as to claim that crime, emotional reactions, and superior accomplishments all stem from a family tree. "Murder will out" and "Blood will tell" are favorite sayings of the hereditarians. According to them, environmental influences can do no more than strengthen traits (desirable or undesirable) that have been transmitted through the genes from parent to child.

At the other extreme is a smaller but equally vocal group who assert that an individual is almost entirely the product of his environment. Biological inheritance, according to the environmentalist, plays a minor role (if any at all) in the development of an individual into whatever kind of person he may become. At least one advocate of the significance of the environmental influences has been known to say that, given a child of any stock, and permitted to control the environment of that child, the latter would be able to develop those patterns of behavior that the experimenter deemed desirable and for the stimulation of which the proper environmental influences had been provided.

Behavior resemblances among successive generations of a particular family, sometimes startling in their regularity of appearance, might seem to uphold the point of view of the extreme hereditarian. Similarly, histories of persons whose behavior reflects to a marked degree the influences of the en-

[1] See K. S. Lashley, *Brain Mechanisms and Intelligence*, University of Chicago Press, 1929. Also J. R. Kantor, "Current Trends in Psychology Theory," *Psychological Bulletin*, 38 (1941).

[2] J. R. Kantor, *op. cit.*, p. 58.

vironment in which they were reared would appear to give credence to the theory that places almost complete emphasis upon the effects of environmental factors.

Because of the complexity of an individual's mental life it has been difficult to isolate any one determining factor as a *sine qua non* of mental growth and development. There have been psychological studies, however, whose findings seem to show that an individual is a product of biological inheritance, congenital influences, and postnatal environmental factors. Granted that the newborn infant has inherited certain potentialities from the family stock of each of his parents, the extent to which these potentialities may be developed and the direction which they will follow depend in large measure upon the kind of environmental influences, including education, to which the child is exposed.

There probably is some basis in fact in the following brief summarization concerning the relationship of heredity and environment to development, especially that of mental ability:

FACTORS	*lead to*	RESULTS
Excellent biological inheritance Rich environment	}	Superior achievement
Excellent biological inheritance Meager environment	}	Good or poor achievement
Poor biological inheritance Rich environment	}	Good or poor achievement
Poor biological inheritance Meager environment	}	Poor achievement

Studies of mental inheritance. Many studies have yielded results that would seem to indicate that the biological factor is the chief determiner of mental traits. Certain family stories often have been quoted by psychologists. In 1877 Dugdale reported the story of Max Jukes (born 1720), an ignorant backwoodsman. Jukes and his wife, an equally stupid woman, started a long family line that was made up for the most part of criminals of all types, paupers, and feeble-minded persons.[3] Another study, indicating the opposite extreme, is that of the Edwards

[3] See R. L. Dugdale, *The Jukes*, Putnam and Company, New York, 1877. Also A. H. Estabrook, *The Jukes in 1915*, Carnegie Institution, Washington, D. C., 1916.

family. Jonathan Edwards (born 1703), a one-time president of Princeton University, and his wife Sarah Pierrepont, a brilliant woman, include among their descendants a long list of brilliant and outstanding Americans — lawyers, public officials, physicians, army and navy officers, clergymen, college presidents, judges and members of Congress, and one vice-president, Aaron Burr.[4]

The story of Martin Kallikak shows a history of two lines of biological inheritance. Kallikak was a soldier in the Revolutionary War who had a son by a feeble-minded girl and who later married a woman of good family stock. Among 480 descendants of his union with the feeble-minded girl only forty-six were normal; the remainder included prostitutes, illegitimate children, and other deviates. Of the 496 descendants of his wife and himself all but five were normal, many of them becoming lawyers, businessmen, doctors, judges, and other professional men.[5]

In each of these studies, the conclusions arrived at as a result of the findings stressed the fact that superior mental ability and feeble-mindedness respectively, with their accompanying emotional and social levels, could be traced directly to the presence of similar characteristics in the family stock. The studies that at the time they were made seemed to offer unquestionable proof of the inheritance of mental ability now are being interpreted differently. So imbued with traditional attitudes toward inheritance were the men who made these studies that they failed to take into account certain environmental conditions that may have been responsible, in part at least, for the characteristics exhibited by the subjects.

An interesting change in emphasis is found in two studies that were conducted at the Vineland Training School for mental defectives. Goddard reported (1914) as a result of his study of the family histories of 300 inmates of the school that feeble-mindedness probably had been inherited in about seventy-seven per cent of the cases studied.[6] A similar study conducted

[4] See A. E. Winship, *Jukes-Edwards: A Study in Education and Heredity*. Myers, Harrisburg, 1900.

[5] See H. H. Goddard, *The Kallikak Family*. The Macmillan Company, New York, 1914.

[6] H. H. Goddard, *Feeble-mindedness, Its Causes and Its Consequences*. The Macmillan Company, New York, 1914.

by Doll in the same institution some twenty years later resulted in a conclusion that not more than thirty per cent of the inmates gave definite evidence of inherited feeble-mindedness.[7]

Although psychologists are not ready to discount entirely the effect of biological inheritance upon mental ability, it is recognized that other factors, such as congenital influences and birth injuries, also must be considered. Our concern over the spread of venereal diseases, especially the effect upon an individual of congenital syphilis, may cause us to overemphasize the seriousness of the problem. Davis reports that of about 175 cases of mentally subnormal children that have been studied not quite four per cent seem to give evidence of syphilitic infection.[8] Small though that percentage may be, educators should join in the campaign to prevent any further incidence of this cause of feeble-mindedness.

Apart from studies of family histories, other methods have been employed to discover the extent to which mental ability may be considered an inherited characteristic. These projects include various areas of study, such as the behavior of identical twins reared together or apart;[9] the constancy of the I.Q.;[10] comparison of urban and rural children;[11] effect of foster home placement;[12] and the influence of formal school experiences.[13] These studies yield conflicting results. Concerning attempts to discover the extent to which biological inheritance may or may not affect mental ability Thorpe says:

[7] E. A. Doll, "Department of Research Annual Report, 1933–34," *Training School Bulletin*, 31:112–123 (1934).

[8] G. D. Davis, "The Behavioral Effects of Congenital Syphilis: A Review of the Literature." Master's Thesis, Indiana University, 1935.

[9] W. E. Blatz and D. A. Millichamp, *The Mental Growth of the Dionne Quintuplets*, Child Development Series, No. 16, University of Toronto Press, 1937. H. H. Newman, F. N. Freeman, and K. J. Holzinger, *Twins; A Study of Heredity and Environment*, University of Chicago Press, 1937. B. S. Burks, "Personality Determinants in a New Case of Identical Twins Reared Apart," *Psychological Bulletin*, 57:552 (1940).

[10] D. Krech and R. S. Crutchfield, *Elements of Psychology*, Chapter XX. Alfred A. Knopf, Inc., 1958.

[11] L. R. Weaver, "A Comparative Study of the Intelligence of East Tennessee Mountain Children," *Journal of Educational Psychology*, 33:321–333 (1942). H. M. Skeels *et al.*, "A Study of Environmental Stimulation," *University of Iowa Studies in Child Welfare*, 15:no. 4 (1938).

[12] M. Skodak and H. M. Skeels, "A Follow-up Study of Children in Adoptive Homes," *Journal of Genetic Psychology*, 66:21–58 (1945).

[13] J. B. Rinehart, "Some Effects of a Nursery School-Parent Education Program on a Group of Three-Year-Olds," *Journal of Genetic Psychology*, 61:153–161 (1942).

. . . it is probably not possible in the light of present knowledge to settle the question of intellectual or any other kind of human potentiality on positive grounds. We can, however, engage in a critical analysis of the implications of the various beliefs advanced and should be willing without undue *a priori* commitment to weigh impartially the evidence for and against opposing and compromise theories. We might, nevertheless, be pardoned for leaning, in the absence of certainty, toward the more socially hopeful interpretations which stress the child's educability and the possibilities of a stimulating environment.[14]

GENERAL ASPECTS OF MENTAL DEVELOPMENT

Areas of development. Broadly interpreted, *mental abilities* include awareness of sensory impulse, or *sensation;* the interpretation of sensations, or *perception;* the power to build upon perceptual material not present to the senses, or *imagination;* the ability to recall that which has been experienced, or *memory;* and the highest form of mental ability, which includes the formulating of generalizations drawn from experience and the dealing with abstractions, or *reasoning.* As the child develops from infancy onward, changes take place in his mental capacities that give indication of progress from the simplest forms of mental activity toward highly complex mental processes. The extent to which this development progresses is the extent of the intellectual growth. The point of development beyond which the individual can engage no further in highly intricate and subtle mental manipulations and insight often is referred to as an individual's intellectual level. A detailed discussion of intellectual growth and measurement appears in a later chapter.

As far as we know, mental development gives no evidence of definite stages. Development is continuous in all areas of mental activity. Studies have shown, however, that development may be more rapid during one age (from infancy on) than during another and that at various ages there may be greater development in one area of mental activity than in others.

In general, individual behavior begins with the reflex responses of the infant and progresses gradually toward forms of activity that involve the functioning of the higher mental processes. In order to trace this pattern of growth, the mental traits that appear to have their beginnings at various stages of de-

[14] From L. P. Thorpe, *Child Psychology and Development,* p. 124. Copyright, 1946, The Ronald Press Company.

velopment will be described in this chapter. It must be clearly understood by the reader, however, that there are no sharp distinctions between the mental characteristics of one period and those of another, and that any such division is artificial.

Learning readiness implies developmental changes in mental capacities. Simple awarenesses gradually take on meaning. Various meanings can be associated and remembered. Overt expression of simple memories or emotional states, beginning in the form of gross body movement, crying, smiling, bubbling, or cooing, follow a progressively developing pattern of language skill. These three aspects of mental maturation — memory, language, and conceptualization — represent continuing interaction between the factors of native endowment and environmental influences. Moreover, mental development, like physical growth, is characterized by a general sequential patterning of responses.[15]

Infancy. At first the child gives little if any evidence of what may be referred to as intelligent behavior. He is concerned almost completely with himself and the satisfying of his feeding and sleeping needs, and physical contacts. It appears, however, that infants can be conditioned to respond to light and touch stimulations.[16] These responses appear to be diffused and unorganized and consist mainly of movements of rejection or acceptance.

The young child. During the period from infancy to about three years of age, the child's behavior begins to show evidences of the functioning of those mental traits that will serve him during his later life. His needs increase and become more definite and more specialized.

The child is aware of thirst, hunger, sleep, temperature, and other bodily needs. During this period he becomes a little more demanding and a little more selective concerning the ways in which these needs shall be satisfied. Even as an infant he had been active in avoiding pain-producing situations. This characteristic becomes more pronounced during this period. The young child also seems motivated in his behavior by a desire

[15] See K. C. Garrison and J. S. Gray, *Educational Psychology*, Chapter 6. Copyright, 1955, by Appleton-Century-Crofts.

[16] See M. A. Wenger, "An Investigation of Conditioned Responses in Human Infants," *University of Iowa Studies in Child Welfare*, 12: no. 1 (1936).

to be recognized as an individual. He demands attention and seeks approval. By the time he has completed his first year of life, he normally has begun to walk and to talk. During the next two years there is rapid growth of ability in walking, talking, and sensory exploration. He is becoming acquainted with his surroundings. He is able to call objects by their names and to make simple judgments concerning spatial relationships.

Time as such means little to the young child. It is measured by him only as intervals between the satisfying of his needs or desires. He cannot distinguish among *today*, *tomorrow*, and *next week*, except as they represent words rather than actual duration of time. A youngster was promised one day by his mother that the family would have a picnic "tomorrow." During the course of the day the child left his play innumerable times to ask his mother whether tomorrow had come. Each answer in the negative caused him to become more impatient over the slow progress of time. Finally his mother tried to explain to him that tomorrow would come after he had gone to sleep and then had awakened. Thereupon, the youngster curled himself up in a chair and slept for about a half hour. When he awoke, he said with glee, "Now I'm awake. It's tomorrow. Let's go to the picnic!"

Toward the end of this age period the child begins to show curiosity about his immediate world, the people in it and the things they do. He starts a series of questions such as *why*, *what*, and *who*. Often as not the child is relatively uninterested in the answers to his questions. Before an answer is half completed, he may have forgotten his first question and is ready with another. His questions are not so much stimulated by a desire to gain definite information as they are concerned with his own developing mental processes.

During this stage of development there may occur the beginnings of a characteristic that takes definite form as the child grows a little older. This is a tendency to "make believe." Objects in the world about him become active living entities with which he may identify himself. For example, the child is shown a picture of a lion and is told something about the animal's characteristics, or he sees a lion in the zoo. Thereupon the child becomes a lion and stalks around the house, growling in true lionlike fashion. This behavior lasts but a short time, however. Very soon he is stimulated to become a "choo choo" train,

a bird, or perhaps, dressed in the parent's clothes, his father or mother.

A little girl of the authors' acquaintance was barely more than two years old when she began to wear her mother's shoes. The higher the heels and the more difficult the shoes were to keep on her feet, the more eager she was to wear them. Dressed in her mother's hat and shoes, with her mother's rouge and lipstick smeared generously over her face, she became her mother. She took great delight in strutting up and down before a mirror, imitating some of her mother's characteristic gestures and modes of speaking.

Toward the end of this period the child gains some realization of the difference between *I* and *you*. However, he is an intense individualist. He is beginning to recognize himself as a person and attempts to impress himself as such upon others. Mothers are well acquainted with the negativistic period through which most children pass. To any question or any suggestion the child's answer is "No" (sometimes a vehement and repeated *No* accompanied by much shaking of the head). Sometimes he will respond to suggestions affirmatively in his actions while he is giving a negative vocal response. At other times he will be stubborn in both word and action and will refuse to accede in any way to the expressed wishes of others.

The young child's rote memory is good. The normal youngster enjoys being shown pictures or having simple nursery rhymes or fairy tales read to him. He demands that the same story be read to him over and over while he listens with rapt attention. If the reader makes a mistake or reads a passage differently from the way it was read previously, the child is quick to correct him and to tell him how it should be read.

Simple problem solving is not beyond the mental ability of young children. Sometimes they are able to work out problems of toy arrangement in a way that shows definite insight. The fact that the approach of a young child to a problem situation is different from that of his elders causes the latter sometimes to have little patience with childish efforts to work out a problem. It is so much easier for a parent to do the thing himself than to watch the child's fumbling motions and apparently slow mental reactions. Although problem solving among young children seems to partake of the nature of trial manipulations, Alpert's

studies of children from nineteen to forty-four months of age led to the conclusion that the results obtained gave evidence of some insight.[17]

It probably is not until children have reached a later stage of development, however, that they have any real success in the solving of problems. According to Harter [18] it is at the age of five that the average child is able to solve problems through the utilization of verbal symbols in addition to the use of concrete materials.

The preschool child. The ages between three and six often are referred to as the preschool or nursery school and kindergarten years. During this period, mental abilities develop rapidly. There is a marked observable difference between the "baby" of three and the school entrant at the age of six.

The beginnings of the development of mental abilities are strengthened during this period. The child's speech improves rapidly. Not only is this true of the number of words that he can use meaningfully and pronounce correctly but also of his use of the various parts of speech, such as nouns, pronouns, verbs, adjectives, and adverbs.

As the child's sensory and perceptual powers increase, he becomes more concerned with all kinds of stimulations. He begins to show interest in that which is new and different from his accustomed home surroundings. "Make believe" is engaged in to a great extent. He tends to reproduce in play, sometimes with a surprising amount of detail, the behavior and experiences of his elders. His perceptual ability is constantly developing.

During a visit of the authors to the home of friends, the little girl of the family, who was not quite six years old, insisted that the male guest play house with her. Together they went through the routine of getting married and setting up the household. Of course, there were gaps in the playing, but the doll children had to be cared for properly. The "father" was given his special duties which he had to perform according to the dictates of the young "mother." Throughout the activity there were reflected some of the daily experiences of the little girl's own

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[17] A. Alpert, *Solving of Problem-Situations by Preschool Children.* Contribution to Education, No. 323. Bureau of Publications, Teachers College, Columbia University, 1928.

[18] A. L. Harter, "Overt Trial and Error in the Problem Solving of Preschool Children," *Journal of Genetic Psychology*, 38: 36–372 (1930).

family, much to the amusement of the guests and somewhat to the embarrassment of the parents of the child. To her, however, the activities engaged in constituted serious business and were not to be taken lightly.

At this age youngsters are eager to help mother and father, but in their own way. Their actual understanding of ways of doing things, growing out of their increased power to perceive and to remember, becomes involved with their strong imaginative facility, and the results may be a weird combination of the real and the fancied.

These youngsters become increasingly able to engage in refined manipulatory movements. During their early years children's drawings represent merely the essentials, such as head, trunk, arms, and legs. Gradually the drawings come to include more details as the children's visual acuity increases and their muscular control improves. However, any application of the principles of proportion generally is lacking.

The four- and five-year-olds can combine their sensory and imaginative experiences in a way that at times seems almost incredible for youngsters of their age. One of the authors recalls an incident that occurred recently in a nursery school. In one corner of the room a group of children were busily engaged in manipulating a number of large blocks. They were intent upon their task and discouraged adult watching of their activities. Finally, the other persons in the room were invited to view the results of their labor. The adults were astonished if not shocked by what they saw. The children had built six large crosses and had arranged them in two even rows of three each. The blocks had been put together with great care and the rows were spaced accurately. Said one of the youngsters in a solemn voice, "They are the crosses on the graves of dead soldiers." The other youngsters were much impressed. Many of them kept returning from their play with other toys to admire the crosses. The builders themselves, however, soon were engaged in new activities. Later, when other children wished to play with the blocks, they first asked permission from the original builders to do so. Thereupon the latter with the help of the new group took down the crosses carefully, block by block. This was no occasion for a careless knocking down of their project.

By the time a child reaches the age of six or thereabouts,

his mental abilities have reached a stage of almost all-round development that provides him with a mental foundation upon which can be built patterns of thinking and behavior that gradually result in his individualization as a person among a group of persons. At the same time the child shares with the members of his group certain likenesses of response. He also gives evidences of differences in thinking, attitude, and behavior that set him apart from his fellows.

When the child is ready to enter the larger environment of the elementary school, his sensory equipment is well developed; his perceptual powers are keen and relatively accurate; his range of attention is such that he can be expected to concentrate successfully on simple material; his memory may be almost photographic; his imagination may function so actively that it sometimes is difficult for him to distinguish between the real and the fanciful; and his interest is changing from great concern with himself to curiosity about and a feeling for other persons and objects in his environment.

Later mental development. With his entrance into elementary school the child begins to widen his mental horizon, as his mental abilities are continuing to develop through the process of natural growth and the stimulation of learning situations.

As the individual passes through the stages of later childhood and adolescence, sensory acuity apart from specific training reaches its peak, perceptual patterns become better organized and refined, greater power of sustained attention is achieved, and memory tends to function more logically. Forgetting, in terms of pleasantness and unpleasantness of accompanying feelings, continues; but, as the individual is increasingly stimulated by material to be remembered, a selective process of remembering and forgetting begins to operate.

The younger child tends to remember almost exactly certain outstanding experiences and important days, such as Christmas and birthdays. Year after year he can recall vividly what he has done on such occasions in the past. As he grows older the increasing number of experiences through which he passes and which absorb his attention may tend to dim the memory for such special events, although certain outstanding experiences which at the time of occurrence greatly impressed him may be

recalled vividly many years later. It is a known fact that during the period of senescence, memory of childhood, adolescent, and early adult experiences may be very strong, but the happenings of the immediate past may be almost completely forgotten.

As has been noted earlier, the developing child gradually loses his almost complete concern with himself and his immediate environment. By the time he is ready to enter elementary school he is mentally equipped to engage in more complex activities than those he experienced earlier. His sensory mechanisms are well developed and his perceptions are relatively accurate. His span of attention has lengthened so that he can concentrate on simple materials and activities. It still may be difficult for him to distinguish between the fanciful and the real, but his interests give evidence of decreasing self-centeredness as he becomes more concerned about other people.[19]

Older children and adolescents delight in solving problems that are within their interest and experience range. Reasoning as manipulation of concrete materials becomes comparison and evaluation of ideas based upon facts. In so far as young people's experiences are limited, however, their generalizations may seem to the adult to be naïve or erroneous. Yet they are gaining increasing power to relate creative imagination to realistic situations. Any apparent differences between the mental processes of adults and young people probably can be explained in terms of degree of complexity.[20]

During his adolescent stage of development the young person becomes increasingly able to utilize the higher mental processes. He formulates his own opinions and ideas. He is an idealist — a young reformer. Since, however, he lacks the background that can be achieved only through experience, his ideals may not be built upon a firm foundation of realism, nor is he always able to divorce emotional attitudes from his attempts at rational thinking.

INDIVIDUAL NATURE OF MENTAL GROWTH

Mental growth and development do not follow a similar pattern for all individuals. There are general tendencies that are common to all maturing children. Nevertheless, the rate

[19] See E. B. Hurlock, *Child Development*, Third Edition, Chapter 8. Copyright, 1956, by McGraw-Hill Book Company.

[20] See L. D. Crow and A. Crow, *Outline of General Psychology*, Chapter 15. Copyright, 1958, by Littlefield, Adams and Company.

and amount of growth vary from person to person. School people need to keep this fact in mind as they plan curriculums, devise techniques of instruction, and work with young people in a classroom.

We probably have not yet discovered the optimum time for the beginning of learning in any one area. In some cases we may wait too long. The learning situations to which nursery school children seem able to respond are evidence that many younger children can adapt themselves to types of learning that at one time were not started until a child was six years old or older. On the other hand, some children might learn more easily and with greater profit to themselves in certain areas if formal instruction were delayed until they had attained greater maturation of their mental functions.

There can be no doubt, however, concerning the influence of environmental conditions and guidance upon the child's mental development. The learning results achieved by means of well-planned programs of education in the home and in the school attest this fact. Whatever his future may hold for him in the way of successful mental achievement, as the young person stands on the threshold of adulthood he has achieved an almost complete maturation of his mental abilities. What he may do with whatever mental capacity he possesses depends upon the experiences through which he has passed and those which lie before him.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Interpret the term "mental traits."
2. Discuss the relationship that exists between growth of the brain and development of mental abilities.
3. From your own experience illustrate the degree of parallelism that exists between physical and mental superiority or retardation.
4. How much truth is there in the assertion that, fundamentally, biological inheritance may set the pattern of environmental influences?
5. Justify the statement that the histories of the Jukes, Edwards, and Kallikak families may illustrate environmental influence as well as biological inheritance.
6. Read one of the studies of identical twins referred to in this chapter. What are the results of the study? Evaluate the conclusions.

7. Why may good biological inheritance and meager environmental influences result in either good or poor achievement?

8. Describe what you would consider to constitute excellent biological inheritance and rich environment.

9. Study the behavior of two young children of about the same age whom you know well. Keep a weekly list of their behavior responses during the remainder of the semester. At the end of the semester formulate conclusions concerning (a) evidences of mental growth and development, (b) differences between the children in their progressive behavior.

10. What should be the attitude of educators toward mentally retarded children?

11. What reasons seem to be most adequate in explaining the fact that urban children (on the average) seem to be mentally superior to rural children? Consult studies on the mental status of urban and rural children.

12. Give examples of "make-believe" among children. For each example explain the probable source of the fantasy.

13. Trace the developmental progress of perceptual interpretation of *an orange* from infancy to adulthood.

14. What is meant by photographic memory? Illustrate.

15. By specific examples, compare the reasoning power of a child of eight, a young person of fifteen, and an adult.

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6

EMOTIONAL DEVELOPMENT

THE extent to which an individual's urges and interests are satisfied is basic to the kind of emotional experiences that are likely to result. A person whose pattern of life runs smoothly, whose reasonable urges and desires meet with fulfillment, and whose interests are achieved successfully tends to be emotionally stable and to enjoy life. If, however, his urges, desires, or interests are frustrated, either because of lack of ability to satisfy them or because of unfavorable environmental conditions, his emotional experiences may follow patterns of maladjustment.

Human beings like to believe that their behavior is based not upon emotional vagaries but upon the operation of intellectual factors that induce self-controlled activity superior in its functioning to emotionally stimulated responses. It is true that many human responses are directed by objective reasoning and judgment; but there are times in the lives of most of us when emotional urges and drives almost completely influence thinking and behavior. Too often, our behavior is so closely linked with momentary interests and desires that little if any attention is given to more basic and far-reaching goalful activity. The emotions should influence behavior but should not become its sole determiners.

Emotional reactions deserve serious attention in any consideration of the problems of human development, especially as these apply to children and adolescents. If, as is commonly believed, emotions are basic to the motivation of behavior, their nature and origin should be understood as well as the means by

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which they can be brought under control and made more service-
able to the individual and society.

MEANING OF EMOTION

The term *emotions* cannot be used interchangeably with such
terms as feelings, motives, drives, urges, and desires. Brief
definitions at this point may be helpful. *Emotion* implies a state
of being stirred up or aroused in one way or another. It involves
extensive visceral disturbance and includes many feeling tones
or varying degrees of satisfaction or annoyance. Feeling may be
a simple degree of emotional experience. The difference between
the two lies largely in the fact that feeling is more localized.
Also feeling tones accompany all of man's experiences, while
emotion is more intense and is marked by more violent visceral
reactions. Psychologists and physiologists are in agreement that
emotion involves feelings, impulses, and physiological reactions.
Impulses or inner drives toward action of one kind or another
may occur in many combinations and gradations.

In defining emotion, attention should be directed toward
bodily activities involved, overt behavior, and accompanying
feelings and impulses. An emotion, then, is an *affective experience
that accompanies generalized inner adjustment and mental and physio-
logical stirred-up states in the individual, and that shows itself in his
overt behavior.* Thus defined, an emotion is a dynamic internal
adjustment that operates for the satisfaction, protection, and
welfare of the individual.

AROUSAL OF EMOTIONS

Emotion-arousing stimuli. The perception of a stimulus
is needed to start an emotional experience. The emotion, how-
ever, is not fully experienced until feelings and impulses have
been aroused and physical and physiological responses have
been made through the functioning of the autonomic nervous
system. To be emotion-arousing, stimuli must be associated
with interest or desire. For example, if a person has developed
an interest in an individual, an object, or a situation, there is
a potential for emotional reaction that will be experienced
whenever the person is stimulated by that in which he is in-
terested.

A stimulus that arouses one emotion cannot arouse another emotion at the same time. A similar stimulus, however, may arouse different and even opposing emotions at different times. As added meaning is attached to the stimulus, the reaction of the individual is affected accordingly. Stroking may arouse the emotion of affection at one time; at another time it may stimulate fear, anger, or hate.

The intensity and duration of emotional responses are determined by the physical and mental condition of the individual and by the persistency and strength of the stimulus. The emotion is likely to continue so long as the stimulus is present and attended to actively. Remove the stimulus, and the emotion is reduced or eliminated. This accounts for the rapid rate of change that is possible in emotional reaction. It helps to explain why an individual can be possessed with the emotion of hate one moment and, if adequate stimuli are presented, can experience a strong affective emotion the next moment, or vice versa.

Many teachers have learned to present new stimuli or to direct the attention of their pupils toward interesting activity when a tense classroom situation develops. Mothers long since have learned to give an infant a rattle to relieve crying or fear by the simple means of changing the stimulus. Given the new stimulus or toy, the child no longer attends to the cause of his distress, and the undesirable emotional behavior subsides.

Physical and physiological changes. Emotion-arousing stimuli produce visceral changes and affect the skeletal muscles. The kind of activity that we observe in a person, such as his behavior during a state of anger, jealousy, surprise, or disgust, constitutes what is known as an individual's skeletal behavior. Overt behavior that is easily observable includes the bulge of the eyes, the flush of the face, the flow of tears, the choke in the voice, the fleeing from the situation, or the attack on the emotion-arousing stimulus. Physiological changes not so easily observed can be measured by the physiologist. These include changes in digestive movements or the action of digestive juices, the flow of blood from the trunk into the limbs, and a decrease in the flow of saliva. The endocrinal secretions contribute to these processes, and they are also assisted by the functioning of the autonomic nervous system. The emotions that are experienced

by one person are revealed to another through these overt expressions, but they are not always correctly interpreted.

CHANGES IN EMOTIONAL DEVELOPMENT

Emotional development during the early years. It is believed that the feeling tones of emotions arise during early infancy. However, it is not known what the emotional experiences of a newborn child really are, since they present a diffused rather than a specific pattern of responses. Although there is wide disagreement concerning the extent of a child's ability to experience feelings of pain, anxiety, and the like at birth, it is sufficient to note that newborn infants often behave as though they were emotionally aroused. There are times when an infant's cries and bodily movements seem to give evidence of emotional experience. However, we are always at a loss to know whether or not these evidences are accompanied by an intensity of feeling.[1]

Before a child can experience an emotional reaction, he must be able to understand in some degree the meaning of the stimulus, his own behavior, and the behavior of others about him. As physical growth continues, the relationship between visceral reaction and intensity of emotional experiences becomes more general and sometimes more persistent. It is relatively easy to distract a child from anger aroused in him by a denial of a wish. An adult, however, may nourish a grudge against an individual who has "beat" him and may even transfer the feeling of animosity toward the "hated" one's family. The child's inability to make abstractions prevents him from transferring his emotional reactions from one situation to another, as is possible for the adult.

The results of studies of emotional development during infancy seem to show that some emotional patterns emerge during babyhood. Bridges' findings concerning the growth of emotional behavior during the first two years of life are presented in Figure 8.[2] According to Bridges, a young child's emotions develop

[1] See C. Landis and W. Hunt, *The Startle Pattern*, Farrar and Rinehart, New York, 1939. K. C. Pratt, A. K. Nelson, and K. H. Sun, *The Behavior of the Newborn Infant*, Ohio State University Press, Columbus, 1930. T. H. Taylor, *Innate Emotional Responses of Infants*, Ohio State University Studies, Contributions to Psychology, No. 12, Columbus, 1934.

[2] K. M. B. Bridges, "Emotional Development in Early Infancy," *Child Development*, 3: 324–341 (1932).

Birth

3 Months

6 Months

12 Months

18 Months

24 Months

Excitement

Distress   Excitement   Delight

Fear   Disgust   Anger   Distress   Excitement   Delight

Fear   Disgust   Anger   Jealousy   Distress   Excitement   Delight   Elation   Affection

Fear   Disgust   Anger   Jealousy   Distress   Excitement   Delight   Elation   Affection   Affection
for Adults   for Children

Fear   Disgust   Anger   Jealousy   Distress   Excitement   Delight   Joy   Elation   Affection   Affection
for Adults   for Children

FIGURE 8. *The Approximate Ages of Differentiation of the Various Emotions from Birth to Two Years*

From K. M. B. Bridges, "Emotional Development in Early Infancy," *Child Development*, 3 : 340 (1932). Permission of Society for Research in Child Development.

with experience but are superficial and variable. Anger and fear expressed as differentiated emotions in later life probably show themselves as general distress during infancy.

By the time a child is six months old, it may become possible to identify his facial and other overt activities that represent a state of anger as distinguished from a state of fear.[3] Changes in the expressions of the emotions continue progressively throughout childhood years. The infant expresses what may appear to be rage by lashing out at the world in general, since he is unable to direct his emotion at the offending object. Later he is able to concentrate his expression of emotion upon that which aroused it. Observable changes also are found in the child's expression of fear and in his reactions to other emotion-arousing stimuli. The changes in ability that cause him to exercise greater motor control as he is aroused parallel the development of his mental ability.

Later emotional development. The child refines his expressions of anger or other emotion as he moves from infancy through childhood and into adolescence. The transition of a general gross expression of one's emotions to a more individual and refined expression gives indication of the gradual effect of training and of control over emotional behavior. The child who squeals and dances with delight later may become the adolescent who expresses his feelings and emotions in more subdued fashion, since the older child often is expected to be less demonstrative in his expressions of emotional appreciation.

Parents and teachers should realize that this change in overt expression does not mean that emotions no longer play an important role in a young person's life. He still needs adequate stimuli for emotional experiences. As the child grows in physical strength and understanding, he responds differently to what earlier were considered by him to be threats or thwartings. He should come finally to achieve the ability to adjust his behavior in terms of what is happening about him.

Increasing age, then, leads to changes in emotional expression and ways in which various emotional reactions are aroused. The accumulation of knowledge and the utilization of the apper-

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[3] See F. L. Goodenough, "The Expressions of the Emotions in Infancy," *Child Development*, 2:no. 2:96–101 (1931). D. A. Prescott, *The Child in the Educative Process*, Part II. McGraw-Hill Book Company, 1957.

ceptive mass or the total background of experience affect these changes. A single experience that occurs in a sequence of events may alter the total reaction thereafter. More specifically, the recognition of a certain person as one's business or social rival may arouse anger or fear when one finds oneself in a situation in which the rival is present. Also, when one experiences great delight in a certain situation, thereafter any similar situation may tend to arouse a pleasurable emotion.

A situation that causes pleasure at one stage of emotional development may lose that stimulus value, just as events that cause fear or anger may have no emotionalizing effect at later times. New knowledge, new interests, or other factors may cause a change in the effectiveness of stimuli after a period of time. Interest, desire, and a degree of thwarting are the components that help to determine the direction of an emotional expression as well as its duration and intensity.

As an individual develops through childhood and adolescence into adulthood, his emotions become more easily classifiable as fear, anger, disgust, hate, grief, affection, joy, and jealousy. His real emotional experiences can be more readily appraised as he grows in ability to convey his inner feelings to others. An individual's total reaction is affected by his *appreciation of* values, desires, and ideals, and by his *interest in* and *reaction to* persons, institutions, responsibilities, points of view, and ideals of others.

DEVELOPMENT AND CONTROL OF SPECIFIC EMOTIONS

FEAR

The nature of fear. Through careful observation and experimentation, notably that of J. B. Watson, it has been discovered that fear is aroused naturally by very few forms of stimulation. An infant, for example, does not fear the dark, fire, snakes, and the like, without conditioning. The kind of stimuli that elicit the fear response without previous training or experience includes loud noises, loss of support, or falling a short distance. Watson found that in such situations the element of insecurity is important.[4] It also is believed that insecurity is the basic element in whatever situations produce fear at any time

[4] J. B. Watson, *Psychological Care of Infant and Child.* W. W. Norton and Company, New York, 1928.

in life. The typical response during fear is flight, since either physical or symbolic flight from a fear-arousing situation appears to be a natural and satisfactory mode of adjustment.

So-called fear may show itself in an infant as he approaches the age of five or six months. As the child's growth in mental ability increases so does his fear potential. The fears acquired by a child under the age of six or seven are associated with the objects and persons in his immediate environment. A given object may not elicit fear at all times. The general surroundings and the child himself are the determining factors. The presence of a dog may arouse fear if the child is alone or if the dog is strange to him, but if his mother or another trusted adult is present he may not be so stimulated. A loud noise that is made deliberately by the child himself does not frighten him, as does a noise coming from another source which he does not understand.

Children evince fear responses to various objects. As discovered by Jersild and Holmes and reported by Kingsley in a study of the fears of children under seven years of age, youngsters display fear responses to "animals, noises, and events previously associated with noises, falling or danger of falling, pain or persons and things which have been connected with painful experiences, strange persons, strange objects, and strange situations."[5]

Once a child has responded by fear to a situation, he is likely to repeat that response during later years and in similar situations. Sudden noise and expectation of bodily injury tend to continue as fear-producing stimuli. However, as an individual discovers that loud noises are harmless or that certain situations are not dangerous, he gradually becomes less frightened by them. There is a carry-over of the original fear for those children who during an earlier experience in a similar fear-arousing situation were greatly frightened even though they were not harmed.

The fears that are most devastating probably are those that are products of the imagination. If worries and anxieties are the results of imagined terrifying situations, the emotional reactions are even more harmful than are those produced by

[5] See H. L. Kingsley, *The Nature and Conditions of Learning*, p. 396. Prentice-Hall, Inc., New York, 1946.

the actual presence of fear-producing stimuli. Imagined fears may continue over a long period of time, since all the individual needs to do is to call upon his imagination for the stimulus that will set off the fear or worry. At the elementary school age and after, many fears are concerned with imaginable, though possible, misfortunes that never materialize.

Fear-producing situations. Numerous factors may contribute to the development of fear at any one time. A definite experience that produced fright, such as a car accident in which a person was slightly injured, can be used as an example. Another may be memory joined with imagination in connection with an earlier episode, such as the one connected with an accident or an equally frightening situation. Or the fear may be a reaction to the events that were associated with the scene of the accident. Consequently, the individual fears to approach the place and sometimes the people who were associated with it.

The fear factor may be induced also by the memory of behavior in which an individual engaged earlier, such as destroying something that should not have been destroyed, injuring someone without cause, or otherwise developing a sense of guilt. A child may pass through such an experience. Unwittingly, he may have done something considered naughty, and he is afraid that his parents, teachers, or associates may discover his misdeed. As he lies in his bed at night, reliving this undesirable behavior, he may come to fear the dark not because of the darkness itself but because of his feeling of insecurity in the dark.

Many of the fears developed by children come to them through experience with everyday phenomena; others are learned as a result of the deliberate teaching received from their elders. Children are disciplined too often through the utilization of the fear motive. They sometimes are encouraged by their parents to be afraid of teachers, of policemen, of the dark, of the "bogeyman," and the like. Unfortunately, some teachers by their actions develop in the young child the attitude that a teacher is to be feared rather than admired and respected. This negative approach to the control of behavior either in the home or in the school usually is used because it is effective, regardless of the fear responses that may be developed by the child.

Early childhood fears exercise a potent influence upon the developing personality of the individual. Retreat is a characteristic fear behavior, but, as an individual matures, he refines his responses to the extent that he represses many of his fears, sometimes to the detriment of his emotional development. An adult may attempt daring feats, such as diving off high places or walking on narrow ledges high above the ground, in order to impress his associates with his fearlessness, even though he may be suffering great inner fear during his exhibitionist behavior.

Fears sometimes are induced by listening to others describe their fear reactions during a harrowing experience. A child learns to fear snakes, not because he has been injured by them but because he has heard that they are harmful; he fears people, not because they will hurt him but because he has heard through others that they are dangerous; he fears to speak before an audience, not because he may not be able to do so but because he has learned that anyone who addresses a group is almost certain to be criticized by some of his listeners. He fears travel by air more than by automobile, not because of its proved greater danger (on the average) but because he is more attentive to the danger possibilities of airplanes than to those of automobiles. The child who grows up in a home or other environment in which fear-producing stimuli are constantly present is likely to have difficulty in removing certain fears from his behavior pattern.

Value of fear. Fear can be desirable as a safeguard against harm to the extent that it leads to cautiousness. Certain fears restrain individuals from engaging in exploits that may prove disastrous. Fear may even act as a spur to greater activity. A desire to do well or to be well thought of is based on a fear of consequences or a loss of prestige if one fails to do what is expected of him.

Fear can be utilized so that it serves the individual in constructive ways. It is fear that acts as a check on behavior. A person may be driven to action by anger, love, hate, or jealousy, but his behavior is held within reasonable bounds through the fear of consequences. In the final analysis, fear acts as a guide to the achieving of conservative living and to the attainment of other social virtues, provided the emotional state induces mentally directed behavior.

Control of fear. Elimination of fear would be impossible and to some degree undesirable. It is valuable, however, to attempt the elimination, to as great extent as possible, of *unnecessary* fears from the life of the growing child. There are certain fear situations that should be met and conquered by every young person, since doing this will help him to be cautious or to achieve respect for law and order. He should fear the danger of being hit by a car, so that he will be careful when he is crossing a street; he should fear the consequences of a fire, so that he will not play with matches or other fire hazards; he should fear lightning (not abnormally), so that he will learn what to do and what not to do during an electrical storm; he should fear to disobey reasonable directions or attempts at control of his behavior on the part of elders who are more experienced than he.

Parents should begin early to remove from the child's environment all unnecessary fear stimuli over which they can exercise control, rather than to introduce as many thrill situations as they can for the sole purpose of watching a child's reaction to such stimuli. Knowledge is an excellent fear remover. The one element that makes a situation especially fear-producing is THE UNKNOWN. When uncertainty enters and lingers, fear possibilities are present. Parents should be concerned about the kind of radio programs to which their children listen, the kind of motion pictures which they see, and the kind of stimuli to which they are exposed in the school or in other social situations. It is as the stimuli are controlled that progress can be made in preventing fear when it should be prevented and in overcoming it when it cannot be prevented. Young people should be helped to develop a sense of values and to synchronize their thinking, their feelings, and their overt behavior.

ANGER

Nature of anger. Anger is another of the emotions experienced by children and adults alike. The term is used to include emotional states ranging from rage to the milder forms of resentment. Anger varies in its form of expression among individuals and from one age period to another. In children, outbursts of anger are found useful for attracting attention to themselves and for obtaining a desired end. It is the early discovery of the suc-

cessful use of anger and its accompanying satisfaction of wants that enables the young child to perfect the particular form of temper tantrum in which he engages.

Interference with his bodily movements or with his feeding activities may arouse in a young infant a form of behavior that seems to be anger. Later in his development the thwarting or denial of his interests or activities serves as a stimulus to call forth the emotion of anger in one or more of its observable forms. When he is thwarted a child screams, kicks, stamps, sulks, or cries. The form of expression that is used depends upon his age and training. Anger usually is aggressive in nature and directed at the object or person that seems to be the cause of the emotional state. In an adult, when desires or activities are thwarted, the resulting behavior often takes the form of profanity, criticism, insolence, or attack.

The temper tantrum represents a display of emotional behavior on the part of an individual of any age for the purpose of gaining what he wants. In the child it takes the form of striking, tearing, crying, kicking, and holding the breath. Unless the child is helped to gain emotional control he is likely to continue the tantrum technique perhaps throughout his entire life, although, as he grows older, he will employ more subtle techniques, such as pouting, dignified withdrawal from the group, or caustic language. If a child "throws a tantrum" before he has learned to talk, the parents may be in doubt concerning the cause of the behavior. He actually may be suffering and may need their help. It is this uncertainty on the part of parents that is the basis of the development in the child of a form of emotional behavior that later is difficult to correct.

As a child learns to vocalize and to use language he begins to express anger in less aggressively physical ways, but he may continue his acts of disobedience and physical resistance.[6] When a little girl is very angry she is likely to say to her mother, "I don't like you" or "I hate you." The angry adolescent may be just as vehement in his expression of resentment, but he has learned to couch his language in terms that are intended to hurt but are less blunt in their wording — such as taunts, innuendoes, ridicule, or sarcasm. Also, in the older boy or girl,

[6] See D. A. Prescott, *The Child in the Educative Process*, Part II. McGraw-Hill Book Company, 1957.

anger may show itself in the form of open rebellion, truancy, or delinquency.

Value of anger. There are values that are served by anger. It is used as attack in attempts at overcoming fear. An individual may be jarred out of his lethargy by its use. One of the authors utilized anger to drive fear out of a student who tended to be overcome by fear when called upon to present an oral report before a class. This student had learned the technique of appealing to the good nature of other instructors and had been excused consistently from engaging in this emotion-arousing situation. On this occasion, however, her instructor was determined that she should overcome this fear which was interfering with her progress as a student. He called upon her to come to the front of the class in order to make the report. She hesitated but, afraid to disobey him, came to the front of the room and sat in an empty seat. Thereupon the instructor said, "Stand here, I'll stand beside you and protect you." She became so angry at the implication of his remark that she answered, "No, thank you, I can stand on my own two feet!" Her anger at her instructor diverted her attention from her fear, and she proceeded to present an excellent report.

Control of anger. Remove the stimulus that arouses anger and it rapidly disappears. If you wish to overcome anger in yourself or to help another to do so, it is important that attention be directed to a stimulus that is very different from that which produces the existing emotional state. The value of counting to ten (to one thousand sometimes is more effective) is to bring into focus a new stimulus which will call forth its own feeling tones as the mind is diverted thereby from the thought of the fear-arousal and will cause the anger to disappear.

Parents and teachers have daily opportunities to apply this principle. Needless commands or derogatory remarks that arouse anger should not be dangled before the child. Of course there are times when it is necessary to deny him his request or to offer constructive criticism of undesirable behavior. If he is angry because he wants candy that he cannot have, he should be given something to do that he likes to do, not simply denied the candy. This example can be multiplied many times for children, adolescents, and adults. Substitute stimuli should be provided — the kind that will call forth pleasurable responses

as the individual is helped to give his complete attention to the changed stimulus.

It also is important for anyone interested in alleviating anger in another to understand the background of the anger-arousing situation. It usually is easier to deal with an individual and his anger if the motives or reasons underlying the behavior are known. A person may have a justifiable reason for his anger. Hence when one is dealing with children (or even with older persons) one should try to prevent or to minimize the provocations that lead to anger. Praise or the use of a compliment is effective in helping a young person to overcome his resentment of a real or fancied hurt. Argument or attempts at reasoning often increase anger while a pleasant remark, even though unrelated to the matter at issue, may divert the individual away from the state of wrath toward a more wholesome attitude.

AFFECTION

For a time, psychologists recommended that a young child should be treated as objectively and as impersonally as possible. Although the promiscuous handling of a baby by members of the family and by friends still is considered undesirable, child specialists advise the giving of affectionate attention to the infant. To receive wholesome affection from others in his day-by-day living may be one of the most important factors in a young child's emotional development. The mother usually is ready to give him this kind of attention. This impulse should not be denied to her, nor the accompanying feeling of security to the child.

The infant is helpless and needs all the care and kindness that can be afforded him. In fact, as the individual progresses through childhood and adolescence to adulthood he needs to feel secure in the affection of another, and to know that he is liked and wanted. This principle works both ways. The child should be trained also to become interested in the needs and welfare of others. From young childhood onward he should be encouraged to form the habit of performing kindly little acts that will bring pleasure to the members of his family and to his associates. The affection of the young child tends to center in the home. If he is properly motivated he extends his affectionate behavior not only to his parents but to his brothers

and sisters and to those who visit the home, especially aunts and uncles. Although affection is the dominant emotion that he experiences in a well-adjusted home, there are times when he exhibits jealousy and varying degrees of resentment if he believes that other members of the family are receiving more attention than he is. To this extent parents need to be impartial and objective in their treatment of the children in the home. Teachers, too, should not show favoritism or seem to have "pets."

SYMPATHY

Sympathy is an emotional expression by means of which an individual tries to put himself in another's place and experience the latter's feelings of joy or sorrow. The ability to express sympathy does not come naturally but requires a long process of training in social consciousness. Unless an individual acquires this ability to a workable degree, he may find himself saying the wrong things and performing acts that are not understood by or acceptable to the person with whom he is sympathizing.

The older child usually shows concern for others and in his own way is deeply sympathetic. His sympathy, although crudely expressed, is genuine. However, by the time he reaches adult status, he may find it just as difficult to give or extend sympathy as to receive it. In order to be of value, the sympathy must be felt. Hence the mere expression of words is likely to be futile unless the verbal sympathy is based upon actually felt sympathy. When a deep feeling of sympathy for a person is experienced, the spoken or written word is less important than the attitude and the behavior of the person expressing the sympathy.

The more similar the experiences of the sympathizer and the one to whom the sympathy is extended, the easier it is to give evidence of real feeling. People often are on guard lest the expression of sympathy may be formal and stimulated by social compulsion, or given for the purpose of gaining favor. No matter what prompts sympathetic behavior, tactful modes of expression are desirable social skills and should be learned and practiced early in life. Young people should not be exposed to sentimental or "gushing" behavior on the part of adults. Stereotyped emotionalized phrases such as "You poor darling" or "honey child" embarrass children and are resented by adolescents.

THE FUNCTIONING OF THE EMOTIONS IN LIFE

Effects of emotions upon behavior. Either fear or rage may cause an individual to tremble. The mouth becomes dry in fear. The rate of heart beat, the blood pressure, and the action of the digestive system may change during emotional excitement. The digestive juices that are secreted along the alimentary canal are affected by emotional disturbance. Pleasant and relaxing emotional states act as aids to digestion, while annoying or tension-producing states interfere with digestion.

Among the stimuli that upset the activity of the glands secreting the digestive juices are chronic fears, undue excitement, anxieties, and worries. These cause a slowing down of the action of the digestive system and sometimes result in constipation. The only effective cathartic is a removal of the cause of the emotional tension. Stomach ulcers, "examination diarrhea," and constipation are well-known conditions that are related to emotional disturbance. The ulcer cannot be healed nor the diarrhea or constipation corrected until the emotion-arousing factors have been removed. Normal emotional functioning has great health value, but extremes of excitement, fear, or worry should be avoided. The person who is not easily disturbed is likely to have good digestion.

Emotional disturbances also may be the cause of speech difficulties. Definite speech defects have been known to appear with little or no evidence of physical deformity in the speech organs. Prolonged emotional strain may cause a person to stutter or stammer. The speech of a stammerer or stutterer often is relatively normal when he is relaxed and at ease. Confronted with situations that cause him embarrassment, he exhibits abnormal speech behavior. There are many situations that arise in the school or in other social groups that may cause an individual to become ill at ease. A speech difficulty may appear as an accompaniment of the emotional behavior.

Attitudes of timidity or of aggressiveness may result from emotional strain or frustration and may show themselves only in the presence of certain individuals or in definite situations. Just as we react differently to each person we meet, so we respond in a very definite way in the presence of certain persons and other specific emotion-arousing stimuli. A child comes to

dislike his teacher not so much as a person but rather because of what has happened to the child in the classroom situation. If he suffers humiliation because he has failed in a recitation, he may dread the thought of participating in another recitation. As a result, he may decide to become a truant, or he even may pursue more drastic measures, such as running away from it all — his parents, his teachers, and others in authority.

Religious experience is emotional as well as intellectual. The inner joy and peace that are experienced by the sincerely religious person are emotional reactions. Religion gives an individual an opportunity to face life's problems with confidence. It develops in him an attitude that will serve him well in crises. Religion, however, should not be lived only on an emotional level but should utilize mental insights as faith is supplemented by reason. The religious experience should become not an emotional indulgence but a way of life.

The emotions determine the direction that an individual's behavior will be likely to take in any life situation. Important stimuli for the inculcation of desirable behavior reactions must emanate from the attitudes and behaviors of both parents and teachers. They condition the activities of children more than is generally realized. The emotional conditioning of young people usually results from unplanned practices; yet the attitudes and moods encouraged in children by the home or the school are as important as the intellectual training that they receive.

Emotional distresses and frustration interfere with learning efficiency. Affective factors in an individual's experience influence the amount and extent of his learning. A child at school learns more effectively when he is properly motivated, since he needs to have developed in him the desire to learn. Once this is done, he in turn increases his efforts at mastery. As the joy of successful achievement is experienced, there is a lessening of the effect of fatigue.

Motivation of learning activities helps the individual to concentrate on what he is doing and thereby to gain satisfaction. Since all learners do not react similarly, the stimulation of learning must be varied for different individuals. It is likely that stimuli which produce unpleasant feelings, strong emotion, or definite shock will affect learning adversely, and that stimuli

which produce pleasant feeling or mild emotion will facilitate learning.

Causes of emotional stress. Almost any situation can induce emotional tension. This is especially true if the individual is unfamiliar with the situation or does not know how to react to it. He may experience a conflict of interests or desires, with resulting emotional distress. In any case, if emotional stresses are to be dealt with effectively, the causes must be discovered and removed or adjusted.

For a young person to be thrust suddenly into a new school or neighborhood may be the cause of acute emotional distress. If conditions in the situation interfere with an easy adjustment, the child or adolescent may develop emotional handicaps that may be difficult to overcome. Every nursery school, kindergarten, and grade school teacher has discovered the need for and the value of giving assistance to the child who comes to class for the first time. Teachers know that the young person's first day or two at a new school is a time of great disquiet for him, as he attempts to adjust to children and an environment that differ from those to which he has been accustomed.

This condition also holds for many young people when they leave home to go to college. They need help in becoming oriented to the new situation. Sometimes upperclassmen take great delight in making life miserable for the newcomer. Hazing, fraternity initiation, and the capturing of snipes, for example, are emotionally charged situations that are faced by the college freshman.

The desire to be loved by someone and especially to earn the affection of an individual of the opposite sex is accompanied by emotional stresses that are not easily resolved. In our present culture, the man is expected to take the initiative in such situations. The girl is confronted with the problem of developing the kind of behavior that is desired or desirable for the purpose of attracting male attention. Hence we find girls competing with members of their own sex in behavior that is not always uplifting. However, in their attempts to satisfy their desires for companionship with members of the opposite sex, adolescent boys and girls often experience great unhappiness. Many a boy has suffered pangs of internal distress before he could must enough courage to ask a girl in whom he was interested .

date. The emotional adjustments that are made between the members of the sexes are a part of the growing-up process and are wholesome until they are interrupted by the interjection of behavior that is socially and individually undesirable.

To be successful adds zest to living and affords emotional stimulation toward further successful achievement. Failure is depressing. Continued failure in school is a common cause of emotional disturbance among young people. It is bad enough to fail, but to have it called to one's attention by associates is too much for anyone to take. Boys and girls who run away from home usually do not do so because they are seeking something, but because they are running away from something. This something usually can be found in failure of one kind or another connected with school life, or in inability to cope with authoritative demands on the part of parents.

The experiencing of conflict in any social situation is more confusing to growing young children than most parents realize. There are conflicting social pressures at home, at school, at church, and in other social groups in the community. A devastating emotional disturbance may possess a young person who desires intensely to join a group to which he is denied admission. Or he may be admitted to a group but then may be expected to participate in activities which run counter to his religious or moral standards, thus stimulating emotional disturbance within him. Similarly, the student who is avoided by his schoolmates because of race, creed, or financial status is subject to emotional conflict. When personal desires are blocked, an individual may engage in behavior in which he otherwise would not have participated.

Emotional stress often is caused by uncertainty concerning vocational choice or problems met in vocational activity. Fortunate is the adolescent who makes his vocational decisions early in life without opposition from his parents. The boy and girl who have difficulty in deciding upon their life work or whose parents plan vocational careers for them that are contrary to their own interests are confronted with conflicts of decision and accompanying stress. The continued emotional strain that is born of attempting to engage in a vocation for which one is not fitted mentally or temperamentally is all too common and fraught with emotional conflict and adjustment danger.

Emotional maturity. Attitudes are important determiners of behavior. They are predispositions to act in characteristic ways as a result of certain stimuli. An attitude is a state of readiness to act, not the behavior itself. An attitude is preparatory and enables an individual to behave consistently. Attitudes are by-products of experience that affect life and direct activity. They are dynamic influences that condition an individual's pattern of behavior. The child who enjoys sufficient food and sleep, who feels secure in his home life, who is given opportunities for self-expression and for social living, and who is protected from experiencing intense emotional stresses may be expected to utilize his attitudes for his better development. He is likely to achieve emotional maturity and to avoid those behavior displays that are so characteristic of the emotionally immature.

It is not uncommon to hear it said that an adult acts like an adolescent or that an adolescent acts like a child. This is another way of saying that the individual is not using emotional behavior suited to his level of maturity. In either case, the behavior is indicative of a retreat to an earlier and more satisfying form of response. Many types of infantilism have been found to exist in the behavior of individuals.

Emotional immaturity is exemplified in various response patterns. Some of these are: *attention-getting* — clowning, affected speech, bizarre appearance; *rationalization* — giving of specious reasons for foolish or undesirable behavior; *projection* — placing blame on another for one's own shortcomings; *daydreaming* — refusal to face reality. Other ego-satisfying reactions include temper tantrums, identification of self with a hero, undue criticism of others, display of jealousy, and generally inconsistent behavior.[7]

Those individuals who have outgrown these modes of emotional behavior usually are well-adjusted and socially competent men and women. Wholehearted participation in interesting work and play activities is a good emotion director. Activity-filled days and sleep-filled nights encourage emotional stability.

[7] See N. L. Munn, *The Evolution and Growth of Human Behavior*, pp. 415–416. Copyright, 1955, by Houghton Mifflin Company. A.T. Jersild, *Child Psychology* Fourth Edition, Chapter 10. Copyright 1954, by Prentice-Hall, Inc.

QUESTIONS AND TOPICS FOR DISCUSSION

1. The total emotional experience consists of three aspects as follows: skeletal or overt behavior, visceral behavior, and emotional experience. Explain.
2. What are the emotional experiences that cannot be observed by another person?
3. Describe a situation in which you observed an individual or a group experience great emotional excitement. What stimuli aroused the reactions?
4. Observe carefully several individuals and try to determine how each responds to emotion-arousing stimuli. Why do stimuli seem to affect different individuals differently?
5. When you do not know the cause, to what extent can you judge the emotion experienced by an infant from observing his expressive behavior?
6. What educational implications may be drawn from the fact that most of our emotions are learned?
7. Name some of the ways in which a pupil may express his anger at a teacher, at a playmate, at his parents.
8. What guidance could you give an adolescent to help him rid himself of undesirable fears? How would you prevent others from developing such fears?
9. Explain the cause of temper tantrums. Describe the different forms that they may take at respective ages.
10. How do emotionally maladjusted adults affect the emotional life of the children with whom they come in contact?
11. Discuss the relationship between the stimulus and the actual emotional behavior.
12. Report on the significance of the emotions in human affairs.
13. What emotion-arousing stimuli do you deliberately seek? How do they affect your personality development?
14. List the important characteristics of an emotionally mature person.
15. Discuss the effect of the emotions on one's health. Of music on the emotions.
16. Under what circumstances may a child develop fear of the dark? of people? of dogs? of failure? of riding horseback?

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7

SOCIAL DEVELOPMENT AND CHARACTER FORMATION

Psychologists, sociologists, educators, government leaders, and business and industrial executives, all are stressing to an ever-increasing degree the significance in modern life of human relationships. Practically no one any longer can live in a state of complete or even partial isolation. Terms such as *intercultural amity, cooperation between management and labor*, and *relations between the sexes* constitute a major part of the thinking and study of a great many people. Fundamental to any program for the betterment of civilization must be a deeper understanding of and adjustment to what can be called the social phase of an individual's total make-up.

We need to appreciate the psychological factors that are basic to an individual's attitudes and behavior toward others. Important also is the extent to which an individual varies in his outgoing tendencies, as a result both of his original nature and of the environmental stimulations to which he is exposed. Nor should we neglect the educational implications of the whole pattern of human living, which represents in its many elements the individual's social consciousness applied to everyday affairs. Social habits that are achieved gradually and sometimes unconsciously result in the development of a form of behavior that to the extent to which it gives evidence of consistency may be referred to as the individual's character. The socially adaptable person can meet the various situations in which he finds himself without deviating from his basic standards of conduct.

THE FACTORS OF SOCIAL DEVELOPMENT

Interpretation of the term. Social growth and development cannot be considered apart from other phases of development, such as physical, mental, and emotional. The linkage among these factors is so close that, whatever may be the nature of an individual's developing social self, his physical and physiological constitution, his degree of mental alertness, and the extent of his emotional maturity as these affect and are affected by other persons either advance or retard the achievement of desirable social attitudes and behavior at any stage of development. According to Powers,

(1) Social development can be defined as the progressive improvement, through directed activity, of the individual in the comprehension of the social heritage and the formation of flexible conduct patterns of reasonable conformity with this heritage. (2) Character can be defined as consistent conduct trends, outer and inner. . . . Character is the deepest and most lasting result of the progressive activity that leads to social growth.[1]

Thus defined, social development places emphasis upon the fact that the growth must be *progressive*. A child or an older individual does not remain socially static. As he is stimulated by social institutions, by the mores and customs of the groups of which he successively becomes a member, and by his own interests and desires, his inner and outer "conduct" changes in one way or another. Nor is the individual a passive recipient of the influence of socializing agencies. Social consciousness and character are the outgrowths of individual activity consistent with the nature and stage of the whole growth pattern and the direction that the development will take in terms of the environment in which maturation is completed.

Inherited factors. In any phase of human development it is relatively difficult to differentiate completely between the unlearned and the learned. Since from conception throughout life an individual is living in an environment in which his maturing potentialities are directed by specific forces and conditions, growth is "conditioned" all along the line. In no area is this

[1] From F. F. Powers, in *Educational Psychology* (Edited by C. E. Skinner), Revised Edition, pp. 102–103. Copyright, 1945, by Prentice-Hall, Inc.

conditioning so potent a factor as in the process of social development.

Certain phases of physical and mental growth may seem to stem from inherited potentialities. In the same way, a baby's first smile or other form of 'outreaching behavior may appear to have its roots in the growing-up process. However, the manifestation of social behavior implies that there is a social environment. One could not exist without the other.

Youngsters may appear by nature to be friendly or unfriendly, sociably inclined or self-centered, sympathetic or "hard-boiled," cooperative or resistant, combative or submissive. However, experiences encountered early in life may so direct an individual's habits of response that it probably is well-nigh impossible to isolate any one phase of social development and label it "natural," except in the broadest connotation of the word.

Areas of social behavior. Most forms of behavior and inherent urges can be said to have their social accompaniments. For example, we eat in order to satisfy a fundamental physical need. What we eat, when we eat, and how we eat are associated closely with the eating customs of our particular group. Specific elements in the hunger-satisfying situations may exercise a psychological effect upon readiness or unreadiness to eat. Recently two couples went to dinner at a restaurant well known to and liked by one of the couples. Unfortunately, the waitress, who had served the latter couple often with complete satisfaction, bore signs around her mouth of the results of what must have been a major form of dental surgery. The food was good and the service excellent, but the physical appearance of the waitress definitely affected the two newcomers' enjoyment of the meal and bothered the others. Although all four had expressed themselves as "very hungry" when they entered, the food was played with rather than eaten with gusto.

Many similar examples could be cited to show the interrelation that exists between social factors and some of our strongest basic urges and interests. There is little that one thinks or does either alone or in the company of others that is not affected more or less by what one may term *social consciousness*. The fact that the two couples referred to did not discuss the appearance of the waitress or complain about it to the management, but rather felt sympathetically toward her, exemplifies a kind

of direction of attitudes that may be displayed in a social situation.

The whole structure of civilization is built upon the fact that normal persons of all ages prefer to share their life activities rather than to experience them alone. The hermit or recluse is looked upon as a deviate whose abnormal retreat from social participation probably has resulted from the fact that he has not achieved the satisfaction of "belonging" to a group or groups of his fellows.

Since a child is born into a particular cultural heritage he eventually develops a pattern of social behavior which in many ways reflects the mores of his cultural group. As is true of other areas of his development, the child's social adaptations gradually are achieved through continuously changing stages in his progress toward social maturity. Although some earlier behavior habits tend to remain fixed throughout life, many differences can be found among children's changing patterns of social development. The child who develops the kind of social habits that can function satisfactorily for him in his early social environment is equipping himself to meet the numerous social situations that he will confront in later life.[2]

Individual versus social. The terms *individual* and *social* often are so used as to imply that individualistic habituation and social development represent two different and opposing patterns of growth. On the contrary, growth in one area encourages growth in the other. The "morale-building sense of personal worth" referred to above is an accompaniment of progress in recognizing social values and engaging in desirable social activities. Not only is the individual learning to achieve satisfaction in his relations with those about him, but he also is improving his ability to manage his own affairs, thus building up a pattern of consistent behavior that is concerned with the welfare of others as well as his own, and that constitutes his *character*.

As we study the social development of a person from birth onward, we find that he makes a place for himself as an individual among individuals as he resists and as he cooperates, as he retreats and as he combats, as he leads and as he follows. In his relations with his family, in his friendships, in his group allegiances, and

[2] See N. L. Munn, *The Evolution and Growth of Human Behavior*, Chapter 15. Copyright, 1955, by Houghton Mifflin Company.

in his contributions to the cultural pattern of his times are planted the seeds of social adjustment and character formation that eventually will blossom forth, under proper guidance, as a flower of worthy human interrelations.

Although children appear to give indications of differences among themselves in their "natural" patterns of social growth, such differences probably are not so great as to prevent redirection toward a desirable level of behavior. Nor are so-called "natural differences" as significant as those induced by the conditions and influences of the environment in which the child grows and learns. Psychologists and educators recognize the effects upon a growing individual of the level or kind of culture by which he is stimulated.

Group associations have been recognized to have value for everyone, since there is constant interaction between and among the respective members of a group. Social stimuli affect an individual long before he is able to do anything about choosing his social environment. It is true that, within limits, a young person can indicate by his behavior whether he accepts or rejects these influences. Yet a child is unhappy if he is isolated from others. Therefore, he learns to adapt his behavior first to that of the members of his own group and later to that of other groups.[3]

Further, the direction of a child's social development depends in some measure upon the reaction of others to his conscious or unconscious efforts at bringing about one or another form of social relationship between himself and others. An older theory of child training placed emphasis upon the fact that a child should be seen but not heard. Our newer philosophy stresses the value to the child of being given many (perhaps too many) opportunities for personal expression. Whether or not extremes of either point of view may be equally undesirable is not a matter for discussion here. But it cannot be denied that parental management of children's "outgoing" responses exercises a potent effect upon the direction that a child's development as a human being will take—whether he will become sociocentric or egocentric in his attitudes or observable behavior. Parental management is, therefore, delicate and important.

[3] See A. T. Jersild, *Child Psychology*, Fourth Edition, Chapters 7, 8. Copyright, 1954, by Prentice-Hall, Inc.

THE DEVELOPMENT OF SOCIAL CONSCIOUSNESS

General trends in growth. There is no one stage or point in a child's development when there can be assurance that he has become aware of the world around him and of himself as a part of this world. When this awareness does begin it is directed primarily at objects and persons in the immediate environment, and simple differentiations among them become possible. With the advent of language ability comes a further enlargement of environment and direction of the self into the world of being.

The child's first untutored and uncontrolled projection of himself as an individual into a world (small as it may be) of actively functioning persons becomes controlled in terms of (1) social usage, (2) rules that govern social conduct, (3) an appreciation of the rights of others, and (4) his own responsibilities as a member of a social group. With the mastery of tools of communication other than the spoken word the child is enabled to spread his own influence as an individual and to appreciate the extent to which individuals, groups of individuals, and events affect the relations which exist among the members of any one group and between groups.

Achieving maturity. Social consciousness becomes fully developed when the growing individual has achieved the power to recognize the full import of social behavior, when regulations and laws governing individual behavior begin to have meaning for him not only as rules to be obeyed but as expressions of general accord on what constitutes desirable group living. For example, he appreciates the value of good government, worthy home relationships, and cooperative living. Finally, he understands at least some of the underlying causes that give rise to grave social problems, and he is willing and able to do his share in meeting and attempting to resolve them.

SOCIAL DEVELOPMENT DURING INFANCY AND EARLY CHILDHOOD

Growth during infancy. As has been noted earlier, the very young infant appears to live what might be termed a vegetative existence. Consciously or unconsciously, he is concerned almost completely with the satisfaction of bodily wants. Very soon, however, he begins to respond to the behavior of those about him

whose responsibility it is to supply his wants. His method of responding is simple but gives evidence of the beginnings of awareness of persons and objects in his environment. By the time a child has reached the age of one year, he has developed a fairly satisfactory pattern of response to adults and indicates by his behavior that he is not unaware of other interests, although he still is primarily concerned with himself.

Infants differ from one another in the rapidity with which they begin to exhibit what appear to be characteristics of social behavior. The results of Bühler's study of infants' reactions presented in Table II and Table III indicate, however, that in more than fifty per cent of the cases studied the infants followed a rather similar developmental pattern.[4] Also, in their detailed

TABLE II.   *Responses of Infants to Adults, Observed in 60 Per Cent or More of the Cases (N = 69). (From Bühler)*

	AGE IN MONTHS
Returns glances of adults with smiling	1 to 2
Is quieted by touching	1 to 2
Cries when adult who is attending him leaves	2 to 3
Smiles back at adult	2 to 3
Disturbed when approached	2 to 3
Returns approaching glance with "lalling"	3 to 4
Displeasure when loses glance of adult	3 to 4
Quieted by caressing	4 to 5
Disturbed by the sight of people	4 to 5
Striving for attention by "lalling"	7 to 8
Stretches out hands toward adults	7 to 8
Cries when adult stops talking	7 to 8
Strives for attention by movements	8 to 9
Pulls on the clothes of adults	9 to 10
Offers adult an object	9 to 10
Imitates movements of adults with a plaything	9 to 10
Organized play activity	10 to 11

study concerning the age of appearance of various forms of "social" behavior Gesell and Thompson found that, although a given week age may be expected to be the normal time for the appearance of a specific response, individual infants may

[4] From C. Bühler, *The First Year of Life*, pp. 56-57. Copyright, 1930, by John Day Company.

vary from the "norm." The results of their observations are presented in Table IV, page 112.

TABLE III.   Responses of Infants to Other Infants, Observed in 60 Per Cent or More of the Cases (N = 69). (From Bühler)

	AGE IN MONTHS
Observes other child	4 to 5
Smiles at other child	4 to 5
Cries if other child receives attention	8 to 9
Offers toy to other child	8 to 9
"Lalls" to other child	8 to 9
Imitates movements of another child	9 to 10
Opposes toy being taken away	9 to 10
Organized play activity	10 to 11
Strives for attention by means of "lalling"	10 to 11
Ill-humor if another child moves away	10 to 11
Setting aside toy and turning toward another child	11 to 12

Early childhood. The young child's play activities illustrate a progressive change from individualization toward socialization. At the age of two months, an infant can be expected, for instance, to hold a small block that is given to him. Later, he appears to gain satisfaction from manipulating blocks and other simple toys, but he plays alone. The child of two years will play with his own toys in his own corner of the room, even though another child is playing with toys in another part of the room. The only awareness of the other child that is exhibited is his attempt to take the toy with which the other is playing. This behavior may result in a tug of war between the two children for the possession of the toy.

Gradually, the concept of *I* as opposed to *you* has more meaning for the child than it did earlier. Other children are brought into the child's life. He still acts in accordance with the policy that *what is mine is mine*, but he also is gaining in understanding of the fact that *what is yours is yours*. As the child approaches his third year he may come to realize that *what is mine is yours also*. During this period children have been known to be very generous with their toys and other belongings. It is not until the end of the third year, however, that cooperative play rather than parallel playing becomes relatively fixed.

TABLE IV. *Temporal Order of Appearance of Social Behavior Items in Babies*

BEHAVIOR ITEMS	BABIES' AGES IN WEEKS														
	4	6	8	12	16	20	24	28	32	36	40	44	48	52	56
	PERCENTAGES OF BABIES SHOWING RESPONSES AT GIVEN AGES														
Responds to smiling and talking	8	62	63												
Visually pursues moving person	12	69	74												
Knows mother	3	21	30	81	92										
Sobers at strangers	0	3	4	35	56										
Turns head on sound of voice	0	3	26	42	50	100									
Accepts strangers	100	100	100	100	80	61	52	59	41	39	39	26	18	18	14
Withdraws from strangers	0	0	0	0	19	8	24	16	47	42	19	48	44	30	9
Adjusts to words					0	8	12	16	47	68	75	94	82	89	73
Responds to "bye-bye"					0	3	3	3	13	35	53	65	38	59	27
Adjusts to commands					0	0	0	3	22	23	31	55	56	73	50
Responds to inhibitory words					0	0	0	3	25	23	28	45	44	52	23
Responds to "So big"					0	0	0	0	6	7	8	26	18	34	0
Elicits attention					0	0	0	0	9	16	14	26	27	53	50
Plays pat-a-cake						6	3	6	19	23	25	42	27	50	9
Plays peek-a-boo							6	0	9	13	11	13	9	25	9

By permission from A. Gesell and H. Thompson, *Infant Behavior: Its Genesis and Growth*, p. 258. Copyrighted, 1934, by McGraw-Hill Book Company, Inc.

During the preschool years a child gradually assumes behavior characteristics in relation to other persons and objects that reflect not only his own growth in power of understanding but also the influence upon him of the factors of his environment. Social consciousness in the adult interpretation of the term develops slowly. The child is sensitive to the attitude of others (especially elders) toward him. He responds to those who give him attention in the form of gifts or words of commendation. However, his behavior toward others is stimulated by self-interest rather than by interest in them as persons. He is living in a little world of his own in which he is gaining experiences and simple insights upon which can be built his later more outgoing behavior patterns.

This is an important period of a child's life. Habits of social response developed during these early years may set patterns of behavior that resist desirable modification during later life. Play situations provide excellent opportunities for young children's social growth. During the ages of four and five, children of both sexes learn to play together and to find their respective niches in the various group activities in which they participate.

Growth of competitive behavior during childhood years parallels that of cooperative behavior. Rivalry usually develops according to the home and community influences to which the child is exposed. If cooperation rather than competition is stressed, he tends to become noncompetitive; if the mores include competition, rivalry acts as a strong motivator of youthful behavior. The specific nature of a child's cooperative or competitive behavior is also determined by his reaction to group attitudes.[5]

Whether the child spends the first five years almost completely in his own home environment or whether he is exposed to nursery school experiences during some part of this period, he is extremely sensitive to the conditions that exist about him. His reactions are influenced by them. The sooner the child is provided with an enlarged environment, the earlier (though not always less difficult) will be his transition from almost complete self-concern toward interest in *self in association with others*, especially children of his own age. If the child attends nursery school or kindergarten he is faced with the problem of adjusting

[5] See L. D. Crow and A. Crow, *Child Psychology*, Chapter 11. Copyright, 1953, by Barnes and Noble, Inc.

to the presence of other youngsters like himself. As Murphy says:

He becomes a member of a small world of children, all near his own age, although differences in age may vary with the arrangement in different groups. This world of children furnishes, from this time on, a major part of his social diet; he is constantly assimilating this, by direct imitation of patterns of other children, by spontaneous reaction to things which they do or to situations which they create, by resistance to this pressure, by repeated experience of tensions aroused by their mere presence.[6]

The direction of a child's relations with other children and adults is a responsibility that cannot and should not be taken lightly by anyone charged with the guidance of the child's attitudes and behavior. In an earlier discussion of the social development of children, one of the authors made the following comment:

"The teachers in the nursery school and kindergarten should be emotionally able to accept the child's dependence upon them and to become parent substitutes in giving to the children a sense of security and demonstrations of affection. This is especially necessary at the beginning of the semester. A child can be rushed into being 'self-reliant' too rapidly, just as the attempt can be made to keep him a baby too long. Children of this age usually have one friend and sometimes two with whom they are identified, usually for short periods. Sometimes they have an imaginary constant companion. A kindergarten boy once had that experience and reported it to his parents daily. He was fond of a little girl who did not attend the kindergarten, yet he told his parents each evening that he played with his friend; he reported fully upon what they did and what they said in their play." [7]

During the nursery school period there are evidenced the beginnings of selectivity in choosing friends and of sex differences in behavior with friends. Girls are more likely to form friendships with girls and boys with boys. Probably about twenty-five per cent of children form attachments with children of the opposite sex, usually with no other reason for doing so

[6] From L. B. Murphy, *Social Behavior in Child Personality*, p. 49. Copyright, 1937, by Columbia University Press.

[7] From L. D. Crow, in *Child Psychology* (Edited by C. E. Skinner and P. L. Harriman), p. 227 (1941). By permission of The Macmillan Company, publishers.

than that the little boy and girl, for example, live in the same neighborhood, share a common interest in toys or play activities, or have reached the same stage of mental development.

Adults, not the children themselves, more often than not are responsible for introducing sex factors into boy-girl friendships. Sometimes adult comments upon a growing friendship of this kind result in the development of shyness on the part of the youngster teased or of conscious attempts (especially on the part of a pretty little girl) to become popular with playmates of the other sex, to the exclusion of the making and keeping of friends of the same sex.

In the early years of social development, friendships usually are limited to the pairing off of two children. Similarity in size and mental and temperamental characteristics, neighborhood proximity, and parental influence usually are the bases upon which these friendships are formed. Some children find it more difficult than others to make friends. The shy child, the over-aggressive and spoiled child, and the only child whose first companionships were limited to those of adults may not be able to engage in the mutual give and take upon which successful friendship must be built on any age level. According to Bridges, the social development of a child can be measured by observing the extent to which a child in his relation to other children *has* rather than has not:

1. Played with another child.
2. Spoken to another child.
3. Occasionally made social contact by touching or pushing a child.
4. Imitated other children's actions.
5. Imitated children's words.
6. Imitated children's laughter.
*7. Often spoken to other children.
*8. Originated new play activity with another child.
*9. Joined group of children in play.
*10. Sought another child's approval.
*11. Asked another child for help.
*12. Always given up toys at fair request.
13. Usually waited turn.
14. Tried to defend own right to materials or place.
*15. Pointed to others' errors.

* Items marked with an asterisk are those which proved to be most significant.

*16. Tried to help others.
*17. Stopped work to aid another child.
*18. Comforted another in distress.[8]

Further indication of desirable adjustment can be measured in terms of the extent to which a child *has not* rather than has:

19. Turned away to avoid another child's friendly advances.
*20. Usually stayed out of group marching or games.
*21. Claimed others' toys.
*22. Interfered with others' work.
23. Destroyed others' work.
*24. Created disorder in group or led others into mischief.
*25. Frequently pulled or pushed others.
26. Frequently complained of others to adult for own gain.
27. Harassed new child by scoffing or shunning.
28. Hit or pinched others for fun several times.
29. Bitten or spit at others for fun.
30. Teased in other ways, causing irritation or discomfort.[9]

* Items marked with an asterisk are those which proved to be most significant.

As the child approaches the elementary school period, he still is interested in the satisfaction of his own wants, but he has learned to seek their fulfillment in terms of the social customs of his group. His desire for security in the affection of others has expanded so that his attitudes and behavior are motivated by a "sense of belonging" not only in the family group but also in the neighborhood or nursery school group of children of his own age. Isolation has given way to cooperation in his relations with others, although quarrels with other children often are engaged in. Little boys seem to derive great satisfaction from fighting with other boys. Girls tend to talk a great deal about themselves with their young companions.

There is apparent an appreciation of the concept of *right* and *wrong*. A child's standards differ from those of an adult, however, since there is a wide gap in the experiences of the two. The child (often encouraged by adults) thinks in terms of black and white — to him there are no neutral grays in conduct. For example, a child is admonished by his parents to tell the truth on all occasions. To his credit it may be said that the child usually takes this literally. Then he hears his parent tell what to the

[8] Adapted from K. M. B. Bridges, *Social and Emotional Development of the Preschool Child.* Copyright, 1931, by Kegan, Paul, Trench, Trubner and Company.
[9] *Ibid.*

parent is no more than a social fib used in the interest of a tactful sparing of another's feelings. To the child this is a lie — no different from the kind in which he is supposed not to engage. Is it surprising that the child becomes confused by the inconsistency of adult behavior and that he learns to adapt his behavior to what is expected of him, while he goes his own merry way imitating adult behavior rather than heeding adult admonition? An attitude of "anything goes just so long as you are not found out" is a characteristic of adults who learned this lesson during their early years of childhood.

Each in his own way, child as well as adult, knows that such behavior is built upon a false premise and that his conduct is based upon expediency rather than upon a real appreciation of ethical values. Children tend toward greater moral and social understanding than they sometimes are credited with by their elders. It is the adult who by his own example encourages the growing child to become an opportunist.

SOCIAL DEVELOPMENT DURING LATER CHILDHOOD

Entrance into the elementary school. The beginning of formal schooling not only increases a child's opportunities for furthering his social development but also gives rise to problems of adjustment that encourage the development of socially desirable behavior through their resolution under skilled and sympathetic teacher guidance. A new environment, many "new" children, and a teacher substitute for the mother offer challenges to the little six-year-old that can be met more or less successfully, depending upon the extent to which he was helped to acquire social awareness during his preschool years.

The expansion of his social world causes the child to be faced with a greater need of recognizing and of applying to his own conduct the principle of "playing the game." Otherwise, he may fail to achieve and maintain his much desired sense of security and feeling of self-esteem. Unfortunately, the rules of the game may be formulated by a teacher whose intent is good but who lacks the ability to adapt these rules to the social needs and abilities of each one in his large group of pupils.

One purpose of education on the elementary school level is to provide learning situations which place emphasis upon the

development of knowledges, skills, and attitudes that are fundamental to participation in organized group living. Similarity rather than difference is the keynote of much of elementary schooling — not only for learning materials but also for modes of behavior. Different children react differently to this leveling process. The shy, retiring child must be taught to assert himself; the aggressive child needs to learn the art of submission. Commenting on this period of development Thorpe says:

> While the teacher is endeavoring thus to conventionalize the child, the child in many cases may be trying out the teacher in the sense of hoping to gain favors which are not in the unacceptable (to him) pattern of behavior. This problem, as well as that concerned with the acquiring of a wider circle of friends from whom he can secure approval, occupy much of the child's attention during the elementary school years.[10]

The child between the ages of six and twelve ordinarily presents a picture of remarkable adjustment to his changing social world. At six, the youngster is confused. The degree of social awareness and ability to conform to a school-accepted social pattern varies with his previous experiences, his stage of physical development, his degree of mental acuity, and the extent to which he has become by this time an outgoing type of youngster. No matter what his developmental pattern may be, however, entrance into the first grade is beset with many problems of social adjustment.

Progress through the elementary school. During their early years in elementary school children tend to form into groups of four or five. To this group they owe their allegiance. Even though quarrels and misunderstandings may arise among themselves, they will fight for the group against any other group in or out of the classroom. As children reach the middle grades the size of their groups increases to about six or eight members. There is a beginning of the separation of the sexes: boys join boys' groups, and girls form their own special cliques. Boys seem to be brought together by similar interests connected with sports, adventure, and the like. The interests of girls' groups tend to reflect a domestic influence, although some modern

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[10] From L. P. Thorpe, *Child Psychology and Development*, Second Edition, pp. 453–454. Copyright, 1955, by The Ronald Press Company.

girls participate in group activities not unlike those of their brothers.

From the age of eleven to about fourteen, children's groups tend to expand and to become highly organized. This is the period of the "gang" or "club." Secret passwords, badges, rules for membership, special places for meeting, elected officers, and specific purposes or activities characterize the preadolescent social group. Loyalty to fellow members becomes more intense. The child experiences a feeling of freedom in his group, but he may submit eagerly to the direction of his conduct by the group leader. The formation of such groups presages later interest in the establishment of high school and college fraternities, sororities, and other secret societies, and adult political, community, or social organizations.

As the child finds himself turning more and more toward interest in group membership, his play activities tend to be carried on away from the home. He still needs to experience the satisfaction of security in the affection of adults — especially his parents and teachers. His greater interest, however, appears to be that of belonging to a select group of his peers. Certain social values are achieved through such group relationships. The honor of the group must be preserved. Tale-bearing is taboo. Fighting other groups in order to maintain group status is an accepted provision of a written or unwritten code of behavior. An individual member of the group must conform to group ideals. The penalty for any infraction of group regulations (sometimes extremely rigid) may be the loss of prestige among his fellows or even expulsion from the group.

Gang activities need not be socially undesirable. Thrasher believes that a boy "is formed by the discipline the gang imposes upon him. He cannot be studied intelligently nor understood apart from this social role." [11] The form of activity in which the members of a gang engage reflects the kind of experiences to which they are exposed in their home environment. Children who are secure in the affection and esteem of their adult associates tend to engage in gang activities that are highly desirable, including active sports, hobbies, the construction of mechanical devices, and the like. Neglected children or children in whom deep resentments have developed as a result of real or fancied

[11] See F. M. Thrasher, *The Gang*, p. 329. University of Chicago Press, 1927.

rejection, or denial of privileges that other children enjoy, may form groups that are anti-social in character. The activities of such groups may represent actual defiance of law and order, and may include gambling, petty thievery, fighting, smoking, and various forms of vandalism.

Participation in group or gang life on the elementary school level is a kind of preparation for adolescent and adult interest and active membership in larger social institutions. The ideals of childhood gangs show themselves on the adult level either in philanthropic and constructive group organizations or in the formation of mobs or highly organized groups of criminals.

One of the values of gang organization is the development of leadership. The gang or social group rallies around one boy or girl who demonstrates by his behavior the possession of certain qualities that are admired and imitated by his followers. Studies have shown that superior physical prowess, mental acuity (unless combined with social snobbery), breadth of interest, and a spirit of cooperation are some of the characteristics that children usually seek in their leaders.

The rather general interest of older children in the formation of groups should not lead to the conclusion that all children engage in such activities. During this age period the formation of groups is an expression (usually unconscious) of young people's desire to achieve the values that are inherent in the pattern of group living — cooperation and competition. There are some boys and girls who either rise to temporary positions of leadership or give evidence of leadership qualities that, strengthened during their elementary school experiences, cause them to become highly respected and successful adult leaders.

Among children at this age level are found also those who can be termed the "isolates" — children who, for one reason or another, fail to achieve popularity among their fellows. They become miserable and withdrawing or aggressive. Their non-acceptance into group life may lead to the development of strong feelings of resentment toward more popular children. Anti-social attitudes thus developed not only may widen the social gap between them and their fellow schoolmates but may result in the carrying over of these attitudes into adult life with pitiable consequences to themselves.

The unpopular child is not always the slow child, although

more intelligent children tend to become impatient with the youngster who is always one step behind them in his understanding of "what it is all about." The unliked boy or girl may be extremely intelligent and an excellent student, but he may annoy his schoolmates by an undue awareness of his own superiority.

The past experiences of the isolated child may have been such that he finds it difficult to engage in normal child activities. He is sensitive; he is more accustomed to adult companionship than to that of his own age group. The only child may display this characteristic. The unpopular child may be the product of a rigid home training which has resulted in the achievement of supposedly high standards of conduct that may be at variance with the displayed attitudes of children reared in a freer home atmosphere.

Little Gertrude is an example of an isolate. Her experiences are the result of home attitudes. An only child, she was brought up very strictly. Her father, especially, constantly emphasized the importance of "ladylike" conduct. Whenever a child in the neighborhood exhibited conduct of which this father disapproved, he would call his daughter's attention to it with the admonition, "Don't ever let me see you do anything like that." On the other hand, Gertrude enjoyed many advantages. From early childhood on, she accompanied her parents to dramatic and musical performances, enjoyed extensive travel opportunities, and was permitted to participate freely in the conversation of her parents and their friends.

She was a bright youngster, who received her fundamental education to the age of ten from her father and mother. Her child companions were hand picked and consisted of one or two girls who met with her father's approval. When Gertrude was ten years old, her father reluctantly consented to allow her to finish the last year of elementary schooling in a near-by girls' school which had an excellent reputation.

The little newcomer into this strange world of group participation and loyalty was very unhappy. Her rigid home training had developed in her a spirit of humility and self-criticism that caused her to underestimate her own abilities (which were superior) and to overestimate the desirability of the outgoing freedom of behavior that was characteristic of her schoolmates.

She wanted desperately to "belong" but felt that she had nothing to offer a group. Consequently, in her classes and during recesses on the playground she hung around the fringes of groups of her schoolmates, observed their behavior, and listened to their conversation. Although she did not dare to intrude, she learned much in this way about the ways of young people of her own age.

Fortunately for this girl she attracted the attention of one of the school leaders who had been watching her behavior. The leader deliberately made friends with Gertrude and discovered that the latter was not so self-contained as she appeared to be but that she had much to offer to a group. Bluntly, Florence (the leader) told Gertrude that she acted like a snob. "But," she added, "I don't believe you are. I'm going to take you into my crowd, but don't you dare high-hat us!" So grateful was this young isolate for the friendliness displayed toward her by Florence that the two became great chums and Gertrude was accepted by the "crowd." Her background of training, her intelligence, her creative imagination, and her willingness to cooperate gradually won for her a leadership status which she maintained during her school life and her adult activities.

However, attitudes developed early are not easily eradicated. Gertrude, now a married woman and successful professionally, still suffers from a kind of sensitiveness to the opinions of other people. A tendency to assume the blame for other people's failure to cooperate still persists. Although she has attempted to maintain her relationship with others on a rational plane and is popular with her associates, fundamentally Gertrude is still an isolate.

Children's friendships and group associations tend to be democratic unless adult prejudice is strong enough to sway their behavior. It is possible for a child whose economic status is superior to that of his classmates but whose personal qualities are inferior to theirs to buy his way into the good graces of his schoolmates. This is not as common a practice, however, as some adults believe. Children are keen judges of the intrinsic worth of their companions. Racial, religious, or economic differences play a relatively minor role in their selection of pals and group associates. This apparent indifference on the part of children toward what to them seem to be superficial matters often causes much concern to biased or sophisticated parents.
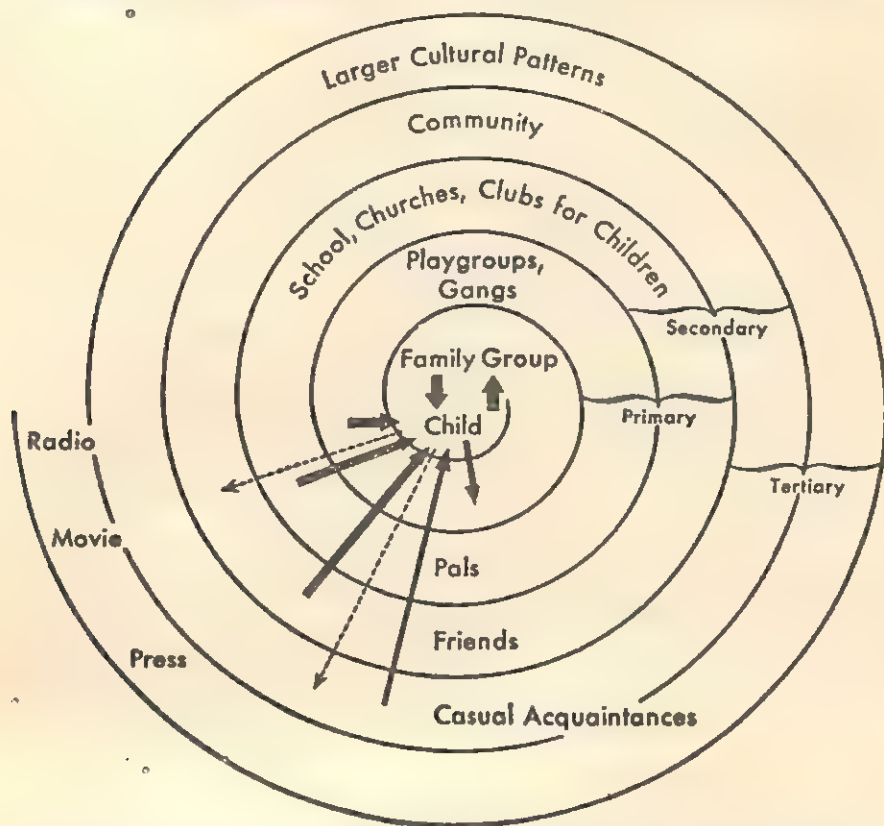
FIGURE 9. *The Widening of the Child's Experience and the Resulting Interaction*

The thickness of the arrows represents the probable relative importance of the interaction between the child and the various individuals and groups.

From F. J. Brown, *The Sociology of Childhood*, p. 45. Copyright, 1939, by Prentice-Hall, Inc.

Competition among groups and cooperation within one's own group are molders of children's attitudes. These attitudes are based upon observable characteristics of the children themselves. They are not, as in the case of older people, an outgrowth of traditional attitudes involved in the concept of social class distinction. Children do not generalize. Adults do, and too often on false premises.

By the time the child reaches the end of his elementary school period he has achieved a fair degree of social consciousness as a result of his experiences with his family, his school associates (adults and children), religious and community groups, and other socializing media, such as motion pictures, radio programs, books, and magazines. As his horizon expands he becomes in-

creasingly able to include in his social world not only the people and objects in his immediate environment but also, by way of books, motion pictures, television, and the like, remote and different social patterns and cultures. Figure 9 presents in graphic form the influences to which the average child gradually comes to be exposed either actually or vicariously and to which he reacts more or less favorably in terms of adult guidance of his interests and activities.

SOCIAL EXPERIENCES OF THE ADOLESCENT

Gradualness of the socializing process. A child does not go to bed one night with a child's pattern of social experience and adjustment and wake up the next morning an adolescent stimulated by those social urges and interests that commonly are designated as characteristic of adolescence. By the time a young person reaches the age of thirteen or fourteen, certain physiological changes within himself, certain attitudes toward him on the part of others and his attitudes toward them, certain "growing-up" processes (interpreted by some adolescents as *grown-up status*) operate to bring about changes not only in the experiences of the young adolescent but also in their effect upon his social relationships.

Some young people display a degree of social development beyond what might be expected of them at their respective ages. Others find it difficult, if not impossible, to achieve desirable social maturity at any age. Many factors operate toward the development of differing degrees of social effectiveness among young people. Some adults give evidence in their behavior of infantile methods of satisfying their interests or wants. A feeling of insecurity developed in early childhood may exhibit itself in adult temper tantrums. Unless as a child an individual is helped to appreciate worthy life values and to direct his behavior accordingly, as an adult he will be likely to base his attitudes and social interrelationships upon false values that cannot fail to lead to his own maladjustment and to suffering on the part of his family or his close associates. Adolescence is a kind of proving ground where a young person can be guided toward making those changes in his demonstrated attitudes and behavior that will help him to enter adulthood with a realistic understanding of his responsibility to his social world.

Boy-girl relations. The growing apart of boys and girls that is characteristic of the later years of childhood seems to give evidence of a developing sex consciousness. The girl of eleven or twelve who enjoys playing games with boys is likely to be dubbed a "tomboy," while the boy who finds enjoyment in the company of girls is a "sissy." Teasing or ignoring girls is the proper boy attitude. Since girls tend to mature physically as well as socially more rapidly than boys, the preadolescent girl may find boys, or a particular boy, very attractive. This fact, however, must be kept secret from all except her closest girl chum. The while the girl is wanting boy attention, her overt behavior is expected to reflect complete indifference to boys, accompanied by frequent comments concerning their boorishness, lack of maturity, and the like.

Young adolescents rarely develop suddenly a strong heterosexual urge. A boy's sudden concern with his personal appearance may seem to indicate a new-found interest in the opposite sex. In the same way a girl may appear almost overnight to exhibit an unprecedented interest in her manners and in her appearance. Dulcet tones, affected mannerisms, primping, imitation of her currently beloved motion-picture actress, martyr-like tolerance of family habits, and periods of daydreaming usually are symptoms of a girl's recognition of herself as a *woman* in a *world of men*. While these symptoms may seem to be sudden in their appearance, subtle and less easily observable adolescent attitudes toward members of the opposite sex usually are gradual in their development.

The emotional factors involved in the onslaught of puberty, with an accompanying changed attitude toward members of the opposite sex, constitute some of the major causes of the confused state in which many adolescents find themselves. The boy discovers that the girl whom he earlier had regarded perhaps as a nuisance now has developed a kind of attractiveness which bothers him. What shall be his attitude toward the charmer? He may seek her company shyly and awkwardly. Because of her more advanced stage of maturity the girl may treat him with disdain and lavish her attentions upon older, more experienced lads, to the despair of the boy. Both the boy and the girl need to learn how to adjust to the new relationship between them. Proper conduct in the classroom, at dances, or in other social

situations is not achieved without adult help — a form of help that may be spurned outwardly by the young person but that secretly is much desired.

Parental attitudes constitute another difficulty. Too often, parents resent losing their hold over their children. The earlier group activities of the child could be tolerated, but the concentration of the adolescent's interest and attention upon one person of the opposite sex is more than some parents can take. In spite of their own adolescent experiences they cannot face the fact that these boy-girl interests are normal and are a preparation for adult participation in the marriage relation and the building of a home. The parent (especially the mother) would like to keep the child a baby, dependent upon parental love and care for the satisfaction of the parent's emotional security. Hence, the making of dates, the time of arriving home at night, the kind of person with whom the date is made, the activities engaged in on the date are a few of the elements of family discord which may be experienced by the adolescent as the price he pays for his association with members of the opposite sex.

There are other complicating factors. What shall be the attitude of the young person toward the object of his attention? How far should one or dare one go in the display of emotional excitement? To what extent is petting desirable or acceptable? Problems that differ in kind and in effect upon the growing adolescent from those that were experienced during early childhood arise to plague the boy and girl; yet they would not have it different.

Most adolescent groups consist of a dozen or more young people. During this period the members of any group include an equal number of boys and girls. The purposes and activities are almost completely social and are not organized to the same extent as in groups of later childhood. Adolescents engage in dancing, hiking, parties (many of them in the homes of one or another of the members), and other forms of social activity which allow for boy-and-girl pairing off within the group.

Sometimes a boy and girl limit their boy-girl relations to associating with each other rather than joining a larger group. This practice is frowned upon more often than not by young people who are members of adolescent social groups. The closeness of the group, together with the degree of loyalty of its mem-

bers one to another, is greater even than it is among children's groups. Each group is a closed entity, jealous of its own membership and generally opposed to the addition to it of new members. A young person is either a member or he is not. This situation holds among older adolescents and young adults in college as well as among boys and girls of high school age.

A young man known to the authors had experienced even during his childhood a strong desire to attend one of our leading colleges. Economic conditions made this impossible when he was graduated from high school. However, he was determined to fulfill this strong urge. For several years he worked during the day and completed two years of study in the evening session of a local college. By the time he was financially able to enter the college of his choice he had earned enough college credits to admit him to the junior class. Academically his two years there were most successful and satisfying. Socially he was extremely unhappy, even though he was an attractive, outgoing young man. There was no place for him in the social life of the college. He had entered it too late. The clubs formed by his classmates during their freshman year were unwilling to include the newcomer. He formed some lasting friendships, but as he phrased it, "Socially I am an outcast." This is a common experience among young people who change from one school to another during their high school and college years.

Members of a particular group talk their own particular kind of jargon comprehensible only to themselves, tend to copy one another's dress and manners, and dance only with members of their own group at large social gatherings. The topics of conversation depend to some extent upon the geographical location of the school and upon the economic and social status of the students. However, adolescents tend to engage in philosophical discussion of life, national and international affairs, sports, sex, vocational plans, interspersed with some good-natured ribbing. Both boys and girls have definite ideas concerning the characteristics they like or dislike in members of the opposite sex, and they are quite frank in their expressions of opinion. However, they also are eager to help members of their clique to improve themselves socially according to the standards of the group.[12]

[12] See L. D. Crow and A. Crow, *Adolescent Development and Adjustment*, Chapters 8 and 9. McGraw-Hill Book Company, 1956.

Most teen-agers are filled with zest for life. They are impelled by a desire for activity, but they are sensitive to the form that this activity shall take. They are constantly on the alert that they shall be up to the minute in their appearance and behavior, but they do not want to be too far removed from what might be termed the conventional. "Adolescents are great imitators. They imitate very often without being aware that they are doing so. In addition, they are filled with natural urges to which they seek to give expression."

In another discussion the authors suggest that "Adolescents tend to believe that in their social relationships they have the right to behave according to adult standards. On such matters as relations between the sexes, recreational activities, speech, mode of dress, and attitude toward government, religion, and community affairs they quickly recognize the attitude and behavior of their elders."[13]

The isolate and the leader. As in the younger age period there are isolate adolescent boys and girls who are not popular, especially among their schoolmates. Usually, unpopularity is based upon the possession of personal qualities that are at variance with teen-age ideals and standards. An unliked student may be dubbed a *prude*, a *dub*, a *grind*, a *know-it-all*, a *grouch*, a *square*, a *drip*, or some such descriptive appellation implying that characteristics possessed by the adolescent run counter to the beliefs of the critics. For the most part, adolescent leaders are chosen from among those boys and girls who give evidence of health and vitality, loyalty, enthusiasm, sportsmanship, skill and versatility, organizing ability, tact, initiative, poise, originality, and sympathy.[14]

As a result of the possession of similar interests and attitudes a strong personal friendship may develop between boy and boy or girl and girl that may continue throughout life. Some young persons meet their life mates at high school during the middle adolescent years, although marriage resulting from student friendships is more likely to happen among older adolescents on the college level. Student leaders of both sexes in coeducational institutions are afforded opportunities to think and work together.

[13] By permission from L. D. Crow and A. Crow, *Adolescent Development and Adjustment.* p. 497. Copyrighted, 1956, by McGraw-Hill Book Company, Inc.

[14] See H. F. Stray, "Leadership Traits in Adolescent Girls," *Sociological and Social Research,* 18:241–250 (1933).

Adolescent family relations. The adolescent usually loves his family, but too often his behavior may indicate just the opposite. There seems to be a constant struggle between adolescents and their parents (especially mothers). Although the teen-ager still needs to feel secure in the love and esteem of his family, his conduct may be motivated by an urge to experience the new and the different.

To his parents, the adolescent still is a child to be cared for, watched over, and controlled. To himself, the adolescent is an independent adult (or near-adult) who wants to try his wings, explore unknown fields of activity, and make his own decisions concerning his clothes, his choice of friends, and his social life in general. Adults attempt to tell the adolescent what to do, but they themselves do not always follow the precepts that they present so definitely as desirable. " 'Do as I say but not as I do' is an attitude that is responsible for many of the problems that arise in the life of teen-age boys and girls as they seek to adjust to their social relationships. 'Don't smoke, don't drink, don't go to night clubs and road houses, don't stay out late, don't be late for appointments, don't choose the wrong companions, don't spend too much time at motion picture houses. Don't! Don't! Don't!' On all sides the young person is thus admonished, warned of the dire results of his conduct if he does not follow these admonitions." [15]

Both parents and adolescents become distressed by the struggle for mastery that may seem to develop between them. Oddly enough, however, adolescents may discourse at great length concerning their family's lack of understanding of them or the undesirable behavior of a brother, sister, or other relative, but the listener dare not agree with the complainer. Family loyalty, in spite of more or less family discord, is so strong that the teen-ager will not allow even his closest friend to criticize the family behavior or attitudes which cause this adolescent so much concern.

Other adolescent problems. The adolescent's own self and its development give rise to many problems of adjustment. In comparison, his childhood years were peaceful and happy. Now he is experiencing all the inner strains of growing up. "The struggle within himself between his childish habits of dependence

[15] From L. D. Crow and A. Crow, *op. cit.*, p. 498.

upon others for the fulfillment of his desires and his recognition of these new-found urges toward freedom from adult restraint and control often creates problems of adjustment growing out of feelings of restlessness, ambition, disappointment, resentment, and discouragement." [16]

Physical attractiveness is a much desired quality. The boy wants to be tall and virile. The fact that he may be shorter than the average or that his physical structure has not yet matured as rapidly as that of some of his associates may cause an adolescent boy much inner disturbance. The girl who is all hands or legs, who may be large for her age, or who does not seem to be as skillful as other girls in managing herself often is extremely bothered by this fact.

A young friend of the authors has always been stout. This condition is partly a result of glandular disorder and partly a result of her habit of overeating. As a child she often was referred to as "pudgy" by her associates. This did not seem to bother her. Against her mother's advice she continued to eat fattening foods. She now is about fourteen and has developed an adolescent interest in her appearance. Unfortunately, she is unable to obtain the kind of clothes that appeal to her in a size that will suit her rotund figure. To her mother's amazement and amusement the girl has gone on a rigid diet in order to develop sylphlike lines. Adolescent desire to "belong" has accomplished something that neither her mother nor her physician could hope to achieve.

Innate intelligence and special skills and aptitudes are much prized possessions of the adolescent. He wants to be witty, to be able to give as well as to take in his associations with his fellows. The boy or girl who dances well, sings acceptably, plays a musical instrument, is skillful in the art of caricature, or has any other special ability can become a leader among his adolescent associates unless his other personality qualities repel them.

The young person who has no special gifts, who cannot stimulate other members of his group, even though he is a good student (sometimes because he is), must win his way through acts of helpfulness and a display of cooperation that will make him a

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[16] By permission from L. D. Crow and A. Crow, *Mental Hygiene*, Second Edition, pp. 108–109. Copyrighted, 1951, by McGraw-Hill Book Company, Inc.

useful member of his group. However, the teen-ager must not seem to be too effusive or too eager to do for the others. Such behavior may be viewed with suspicion as a technique employed for the purpose of "crashing" a particular clique.

The social factor also may affect an adolescent's vocational interests. If the members of his group are planning to attend college, or a specific college, he wants to do the same, even though a college education or attendance at the specific college is undesirable in terms of his vocational interests and his abilities or his economic status.

Similarly, certain occupations have better social standing than others. The adolescent is hesitant to admit to his group that he cannot or really does not want to engage in these socially more desirable fields of work. This adolescent characteristic very often shows itself in high school yearbooks. In those schools in which it is customary to include with the picture of each of the graduates the post-high-school plans of the students, some individuals will allow to be entered next to their names the fact that they plan to enter college or another institution of higher learning when, as a matter of fact, they know that they expect to take a job as a mechanic or a salesperson. They may admit that they expect to enter "business" but add "college in the evening," if such opportunities are available.

Need for guidance. To a certain extent, adolescents are snobs. They are conscious of the fact that they are approaching adult status; yet at the same time they are bewildered, unsure of themselves, and anxious to do the right and acceptable thing in their relations with others. Although they may seem to be completely independent of adult control, especially that of their parents, they need and seek help.

During their many years of working with adolescents and young adults on the high school and college levels, the authors have been asked literally thousands of questions concerning what constitutes the rights, the responsibilities, and the proper conduct of young people. These questions deal with home relationships, school experiences, social adjustment, and vocational plans.

In almost every instance the question involves an *I–you* relationship. Probably never before or never again is an individual so conscious of his status as a social entity as he is during the

ages of about thirteen to nineteen. Although young people differ as to the time when they develop this strong social consciousness, it is likely to appear sooner or later and bring with it many problems of adjustment and innumerable questions the answers to which are eagerly sought.[17]

EDUCATION AND SOCIAL DEVELOPMENT

Education and the young child. There is difference of opinion among parents concerning the values of nursery school training. Many parents seem to feel that sending a child two and a half or three years old to a nursery school is denying to the child that close intimate care and protection that he needs during his early formative years. Other parents view a nursery school as a place in which children are "dumped" in order to give the mother more freedom to participate in activities other than those connected with the training of the child.

Much of a child's social education should and does take place in the home. There are values, however, that accrue to the child from the associations he makes in an organized group of youngsters of his own age. Also, he is introduced in the nursery school to certain routines of group living that will be of service to him in his later school and social life. "The home may be well organized, and it may reflect an attitude of trained understanding of child nature and needs. However, because of the encroachment of other duties and interests in the family, these needs rarely can be met as efficaciously as is possible if the program [in the nursery school] for at least part of the child's day is centered completely in his desirable physical and social adjustment.

"In the nursery school the young child is afforded an opportunity of developing, in a quiet, routinized environment, the primary skills of eating, caring for toilet needs, manipulating toys, and playing games. He also learns to associate with other children in this indirectly controlled environment. The formal organization of the nursery school makes possible a progressive learning process conducted in an orderly fashion." [18]

Children vary in their responses to the socializing influences

[17] For a sampling of adolescent questions concerning the various areas of life adjustment see L. D. Crow and A. Crow, *Adolescent Development and Adjustment*, pp. 338–339, 425–426, 465–467. McGraw-Hill Book Company, New York, 1956.

[18] By permission from L. D. Crow and A. Crow, *Mental Hygiene*, Second Edition, p. 90. Copyrighted, 1951, by McGraw-Hill Book Company Inc.

of nursery school, but studies of individual children show that nursery school experiences tend to improve their ability to care for their own needs, such as toilet routines, putting on and removing outer garments, serving themselves at meals, and the like. Similarly, most nursery school children learn to participate in group activities rather than to remain passive onlookers. Greater independence also is exhibited, and possible tensions between parent and child are lessened. In general, then, attendance at a nursery school helps the young child in his socializing process.[19]

The kindergarten shares with the nursery school in providing opportunities for preschool children to develop an appreciation of themselves as members of a group like themselves. Since kindergarten children are older than nursery school youngsters, the activities in which kindergarteners participate are a little more routinized than is possible during the earlier years of the child. The atmosphere of both types of school, however, is informal. Uncontrolled behavior on the part of a child is curbed in the interest of the group, but there is a naturalness about the activities in which the youngsters take part that affords them an opportunity to develop habits of behavior that represent freedom without license and control without rigidity.

School influences during the middle years. The social characteristics of the elementary school child need to be given consideration in any school program that is planned for them. Neither extreme rigidity nor completely uncontrolled self-expression is what the child needs. From the age of six to twelve the young person should be helped to participate in group projects that teach him to work well with others. Moreover, through actual as well as vicarious experiences normal curiosity about people and things should be satisfied. Children during these years also should be provided with opportunities to exercise self-direction in terms of their interests.

[19] For a more detailed treatment of the behavior of nursery school children see: A. T. Jersild and M. D. Fite, *The Influence of Nursery School Experience on Children's Social Adjustments*, Child Development Monographs, No. 25. Bureau of Publications, Teachers College, Columbia University, 1939.

B. W. Hattwick, "The Influence of Nursery School Attendance upon the Behavior and Personality of the Preschool Child," *Journal of Experimental Education*, 5:180–190 (1936).

M. Almy, *Child Development*, Chapter 7. Henry Holt and Company, 1955.

Proficiency in the fundamental tools of learning should be sought, but such proficiency should be achieved in classroom situations which stimulate the child not only to gain skills and knowledges but also to develop attitudes of cooperation both with adults and with young persons of his own age. Hence, the child's interest in group activity should be encouraged and directed toward participation in worth-while classroom projects.[20]

Education and the adolescent. A well-organized high school or college can provide many opportunities for its students to participate in self-initiated projects and social activities. There also should be organized student self-government under sympathetic and tactful teacher guidance. Community-school relations should be encouraged. Every student should be able to find in the school some form of social activity that will meet his particular interests and that will challenge him to successful participation in the activity. All subject-matter areas, especially the social sciences, English, home economics, hygiene, foreign languages, music, and art, can well be made media for increasing the adolescent's understanding of people and their customs.

The individual student and his social problems need careful consideration. Records of maladjusted behavior, slight or serious, should be kept and individual help given whenever this is necessary. The role of the teacher on any school level should not be minimized. During secondary school and early college years the influence of the teacher is a potent factor in the young person's adjustment. By example, by sympathetic precept, and by an ever-ready willingness to share with his pupils their joys and their sorrows, their social successes and their failures, the teacher can become a tower of strength to eager, confused young people who are struggling toward adult social status.

Other socializing influences. Radio programs, motion pictures, the press, and current magazines receive much attention from the young person. Their influence constitutes an important factor in the development of his social attitudes and ideals. In spite of some of their faults these nonformal educational influences have great value in that they bring the world to the individual.

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[20] See H. L. Caswell and A. W. Foshay, *Education in the Elementary School*, Third Edition, Chapter VI. American Book Company, New York, 1957. Also A. T. Jersild, *Child Psychology*, Fourth Edition, Chapters 7 and 8. Prentice-Hall, Inc., 1954.

As he listens to, sees, and reads about the doings of people, discovers the life values that are important to some, and is stimulated by expressions of high idealism, his own interests and attitudes are affected. If the growing young person is helped to be selective in his utilization of these agencies of education, if he can separate the chaff from the wheat, if he can learn to emulate the behavior of fine leaders and constructive citizens, and if in his home, school, and community relations his experiences are wholesome, he can be expected to become an adult of sterling character and a well-adjusted and constructive member of his social group.

Socializing effects of camp experience. The value of camping experience to growing boys and girls is becoming increasingly recognized. Summer camps for children began as philanthropic projects for the purpose of giving underprivileged city children an opportunity for physical rehabilitation as they enjoyed fresh country air and outdoor experience for at least two weeks each summer. The "camp" movement has become popular among people of all social classes. All-summer, fee-charging camps (often expensive) are increasing in number and size throughout the country. Some of these camps are segregated as to sex; others are coeducational. Functions other than physical health improvement are served by these camps, such as the following:

1. Children are taught regularity of daily habits and personal responsibility in simple housekeeping activities.
2. An opportunity is afforded children to participate under trained adult leadership in many forms of activity: boating, swimming, hiking and nature study, horseback riding, wood craft, dramatics, music, and other socially desirable areas of activity.
3. The informal relations that exist among the campers and between counselors and campers provide excellent training for group living.
4. Parent-child tensions that may develop during the course of the year are relaxed by this period of separation.
5. Camp life is an excellent character-builder. The child as a member of a closely knit community must learn to adjust his behavior to meet the group standards. Individual rights or responsibilities are clearly defined and strictly adhered to.

Parents are becoming more and more camp-minded. One recent evening in July, the authors had occasion to participate

in the sending to camp of a group of boys from the Pennsylvania Station in New York. Some of these boys had come from a relatively rural area in Ohio to spend the summer in a Vermont camp. Physically, they were in excellent condition. Other values were to be served by their camp experiences. The reaction of one mother was interesting. This summer was her eleven-year-old son's third summer at this particular camp. During the course of conversation she made the following remark. "The first year John went to camp, we all were tearful. We realized the worth of the experience, but couldn't quite give him up for eight weeks. Now, John and his father as well as myself look forward with delight to his going. For about a month after his return he is an angel!"

Some years ago the New York City school authorities were actively interested in camp projects. Through the efforts of Mrs. Johanna Lindloff, a former member of the Board of Education, an excellent camp was established to which were sent elementary school children who were selected because of their need for experience (especially physical). Although New York City has discontinued the experiment, the school camp is a state-wide project in California.

More and more parents are sending their children to summer camps. They recognize the value to young people of communal living which affords many opportunities for healthful peer-group activities under trained supervision. The public is becoming aware of the benefits to be derived by young people from experiences gained through well-organized camping projects sponsored and conducted by the school. It is possible that an all-year school may emerge that includes camp experience as an integral part of the program. The cost factor must be considered but if maladjustment thereby can be reduced, the money will be well spent.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss the relationship between social development and character development.
2. What is meant by the "dynamic" nature of child behavior? How is it associated with the social development of the child?
3. Using specific examples, trace the growth of social consciousness from birth to the age of six.

4. Why cannot social development be considered apart from other phases of growth? Indicate the interrelationships that may exist among all of these "phases."

5. How might the term "social age" be interpreted in relation to chronological age? Illustrate.

6. State arguments for and against the validity of this statement: "A child's social status is an outgrowth of his inherited nature."

7. Distinguish between gregariousness and socially stimulated behavior.

8. Justify by illustrations the fact that an individual's pattern of social development is conditioned by environmental factors.

9. When is an individual socially mature?

10. From your personal observation of infants do you agree with Bühler's findings?

11. What is the relationship between social consciousness and the attitude of unselfishness? Illustrate your opinion by examples taken from (1) early childhood, (2) later childhood, (3) adolescence, (4) adulthood.

12. How can school people utilize for educational purposes the "gang spirit" that is characteristic of later childhood?

13. What may have been the childhood history of an adult "gangster"?

14. What is an "isolate"? Discuss the factors that may cause a young person to become an isolate. Illustrate.

15. List adolescent problems of social adjustment that have been experienced by some of your teen-age associates. Attempt to explain the possible causes of each of the problems listed.

16. What were your social experiences as an adolescent? How have they influenced your present social attitudes?

17. Which do you consider to be psychologically more desirable: schooling segregated as to sex, or coeducation? Why?

18. Recall the child and adolescent leaders whom you have known. What were some of their outstanding characteristics?

19. Suggest ways in which the school on its various levels can help growing young persons to develop desirable social attitudes and modes of behavior.

20. What is meant by a person of "sterling character"? Make a list of ten well-known political or social leaders of today. Discuss their activities from the point of view of *character*. What is one of the greatest needs of the world today?

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Part III

THE LEARNER'S
POTENTIALITIES

In so far as it is possible, modern education accepts the responsibility for guiding the development of all aspects of an individual's personality. If this purpose is to be realized, educators need to recognize the potentialities that are general for all learners and those that are specific to the extent that individuals differ from one another. Hence the chapters included in Part III are concerned with the various aspects of learner potentialities, and their significance in the learning process. Attention is directed to differences among pupils in their learnability — general and specific.

8

INTELLIGENCE AND ITS MEASUREMENT

Perhaps no single factor has influenced educational theory and practice to a greater extent than has the attempt of twentieth-century biologists and psychologists to discover the relationship between the higher mental processes and effective behavior, especially in regard to learning. In the past, it was assumed that everyone who seemed to be like everyone else was normal. Anyone who appeared unable to respond as others did, especially a child, was said to be feeble-minded.

Differences among learners were recognized, but such differences were ascribed, more often than not, to laziness or unwillingness to learn. At present, the results of biological and psychological studies dealing with the rate of mental development and the various functionings of the intellect have not yielded completely or even partially satisfying knowledge concerning differences in intellectual ability. We are not yet quite sure just what the term "intelligence" connotes. However, certain tentative conclusions have been formulated that possess educational implications of value to school administrators, teachers, and learners.

NATURE OF INTELLIGENCE

Intelligence and everyday life. Observable differences among individuals of all ages in ability to meet challenging situations are recognized by parents, teachers, employers, other adults, and even children. Whether a person is skilled in this

or that activity, appears to possess accurate information in his specific field of knowledge, or is able to solve a practical problem is evidenced to a greater or less degree in his daily behavior. On the basis of past performance, he is requested or permitted to assume certain responsibilities or he is denied participation in a particular activity.

Daily contact with people in varying situations leads to a constant evaluation and re-evaluation of this one's or that one's ability to meet efficiently the demands of a particular situation. The attempting of any valid conclusion concerning the consistent behavior of an individual, however, may be a long and costly process, especially if past performance is to be accepted as a guarantee of what can be expected in the way of future success.

If an employer were to hire a worker without first discovering the latter's capabilities, particularly for work that is of a complex nature, the employer might find that the possible incompetence of the employee would do irreparable damage to the business. If a teacher were to say that he would accept learners in his particular subject area without knowing anything about their ability to master the learning material, believing that he would be able to discover that fact during the term, this teacher would be wasting the time and the energy of the learner who does not possess sufficient ability for mastery. Competence in any area depends upon interest in the activity and needed skills and information; but more than these is needed the potential ability to acquire a satisfactory degree of competence. It is toward this discovery of potential power to achieve that the efforts of psychologists are directed in their attempts at an analysis of those mental functions that constitute the higher mental processes, or *intelligence.*

Early work in the field. During the second half of the nineteenth century, as a result of laboratory experiments and simple tests administered to children, Wundt in Germany, Galton in England, and Cattell in America discovered that individuals differ in the accuracy and speed of their responses when they are tested in simple functions. Galton conceived the idea that if the responses of many individuals were arranged in order of successful achievement a large number would give evidence of relatively similar responses, while a small number would tend toward superior or inferior performance respectively.

During the late 1800's tests were developed for the purpose of measuring single abilities, such as spread of movement, sensation (visual, auditory, etc.), and reaction time. The work of these pioneers was limited to attempts at isolating *single* simple factors of response and testing these in relation to one another, thereby arriving at a measurement of intelligence which was considered to be a product of these simple variables. Cattell has been given credit for introducing the term *mental tests*.[1] By 1880 Ebbinghaus had succeeded in devising tests through the use of which could be determined with some degree of accuracy the extent to which individuals differ in ability to memorize. Other tests also were devised that showed differences among individuals in such activities as the completion of sentences, the cancellation of words, and the association of words.

As a result of his studies in these isolated performance areas, including attention and memory, the French psychologist, Alfred Binet, concluded that intelligence is more than the sum of these isolated functions and that intelligent behavior should be evaluated in terms of activities that combine these various items. He believed that degree of intelligence showed itself in the responses of persons of all ages to situations in their immediate environment.

Because of his laboratory experiments with some of the lower forms of mental processes, he and his co-worker, Théophile Simon, were asked by the French Minister of Education to devise a method of distinguishing between normal and feebleminded children. The tests that they constructed are discussed later in this chapter.

Attempts to define intelligence. The fact that intelligence is a concept rather than a power or a thing that can be observed causes difficulty when a definition of it is attempted. Intelligent behavior can be evidenced in a great many different ways, depending upon the situation in which a person finds himself. What is it that causes one individual to be more effective in his behavior in a particular situation than another, even though both would seem to have had similar experiences up to the time at which they are confronted by this particular situation?

Intelligence is a function. The behavior that results from

[1] J. McK. Cattell and L. Farrand, "Physical and Mental Measurements of the Students of Columbia University," *Psychological Review*, 3: 618–648 (1896).

the degree of successful functioning of this elusive combination of the elements of mental capacity would seem to give a measure of an individual's intelligence. It is relatively easy to differentiate among people in terms of some of the lower mental processes, such as the ability to memorize or to make simple associations. Differences in general intellectual capacity must include a consideration of the so-called higher mental processes, although exactly what these are has not yet been fully agreed upon by psychologists.

Interest in the interpretation of intelligence and in the construction of tests for the measurement of intelligence ran high during the first quarter of the present century. So varied were the concepts of intelligence, as these were stated by psychologists working in this field, that a symposium was held in 1921 as an attempt to reach agreement concerning what intelligence really is. The controversy is not yet over. Various explanations have been offered and still are being offered concerning the bases of differences among individuals in the ability to act intelligently.

Terman, an American psychologist who introduced the Binet test into America for general use in differentiating between degrees of brightness and dullness, contributed his definition at the symposium. To him intelligence was "the ability to think in terms of abstract ideas." [2] This definition seemed to be too limiting, however, even from the point of view of Binet, who presented his interpretation of intelligence in the following words: "Comprehension, invention, direction and criticism — intelligence is contained in these four words." [3]

Similar in concept but more widespread in application is an interpretation of intelligence as the ability to adjust, apart from learning — an interpretation that was popular especially among early workers in the field. Stern phrased it thus: "Intelligence is a general capacity of an individual consciously to adjust his thinking to new requirements: it is general mental adaptability to new problems and conditions of life." [4] Commenting on this definition Thorpe says:

[2] L. M. Terman, in the symposium, "Intelligence and Its Measurement," *Journal of Educational Psychology*, 12: 123–147, 195–216 (1921).

[3] Alfred Binet; quoted in L. M. Terman, *The Measurement of Intelligence*, p. 45. Houghton Mifflin Company, Boston, 1916.

[4] W. Stern, *Psychological Methods of Testing Intelligence*, p. 3. Warwick & York, Inc., Baltimore, 1914.

This view of intelligence broadens its scope to include dealing with problems of a non-academic variety and problems of a mechanical, artistic, and social nature. It does not give the bulk of credit for being intelligent to those who are facile in the use of language and other symbolic materials. It also harmonizes with the social objectives of modern schools which are more vitally interested in the personality development and social adjustment of their pupils than in the acquisition of academic knowledge for its own sake.[5]

An empirical interpretation of intelligence is contained in Thorndike's concept of it as the "power of good responses from the point of view of truth or fact." [6] Thorndike further emphasizes three aspects of intelligence — altitude, breadth, and speed, or the degree of ability to perform difficult tasks and the number of tasks of equal difficulty that can be performed in a given time.

Other definitions of intelligence presented in the symposium include: [7] "Intelligence . . . involves two factors — the capacity for knowledge and knowledge possessed" (Henmon); "An individual possesses intelligence in so far as he has learned, or can learn to adjust himself to his environment" (Colvin); "It is an acquiring-capacity" (Woodrow); and ". . . the capacity to learn or to profit by experience" (Dearborn).

The various concepts that have been stressed by different psychologists were evaluated recently by Stoddard and their functional elements were included in his description of intelligence as

the ability to undertake activities that are characterized by (1) difficulty, (2) complexity, (3) abstractness, (4) economy (speed), (5) adaptiveness to a goal, (6) social value, and (7) the emergence of originals (inventiveness), and to maintain such activities under conditions that demand a concentration of energy and a resistance to emotional forces.[8]

The term intelligence or intelligent behavior is used by the layman to explain degree of success in the meeting of general life situations. However, the more formal measurement of intelligence as an attempt to prognosticate individual capacity

[5] From L. P. Thorpe, *Child Psychology and Development*, Second Edition, p. 164. Copyright, 1955, The Ronald Press Company.

[6] E. L. Thorndike, in the symposium, "Intelligence and Its Measurement," *Journal of Educational Psychology*, 12:123–147, 195–216 (1921).

[7] In the symposium, "Intelligence and Its Measurement," *op. cit.*

[8] See G. D. Stoddard, "On the Meaning of Intelligence," *Psychological Review*, 48:255 (1941).

to learn is limited in great part to the construction and administration of techniques of measurement for the purpose of discovering to what extent a pupil can be expected to succeed in this or that area of school learning. The elements or actions that are evidences of learning ability include facility in the use of numbers, language efficiency, speed of perception, facility in memorizing, facility in comprehending relations, and imagination.[9]

Important theories. Granted that we may be able to come to a satisfactory agreement concerning the function of intelligence as it is evidenced in a person's degree of learnability and adjustment, we still are faced with the question: What is the *nature* of the higher mental capacity or intelligence that leads to this or that behavior? Much attention has been given to the study of this problem by some of our leading psychologists, and various theories concerning the nature of intelligence have emerged as results of their experimental research in this area.

Spearman's two-factor theory. According to Spearman, an English statistician, intelligence consists of general ability that works in conjunction with special abilities. Fundamental to all intellectual functioning is the influence of the G or general factor, but the presence of various special or s abilities is responsible for the relationships that exist between specifically demonstrated abilities, such as musical or athletic skill, for example, and language facilities or facility in other areas. Referring to mental tests, Spearman says:

What really is measured — and alone ever can be measured — by such a pooling of miscellaneous items is the factor (should one exist) which, amid continual diversification otherwise, persistently enters into them all. This factor is no process of intelligence of any sort. Nor, by itself, does it even furnish any sort with a measurement. Really to measure any intelligence-process whatsoever, due account must be taken, not only of the said factor shared with all others, but also of the supplementary factor peculiar to itself. In terms of our psycho-physical hypothesis, there is need of ascertaining, not only the potential of the general "energy," but also the effectiveness of the specific "engine" employed.[10]

[9] See A. M. Jordan, *Educational Psychology*, Fourth Edition, Chapter 5. Henry Holt and Company, 1956.

[10] From C. Spearman, *The Nature of "Intelligence" and the Principles of Cognition*, p. 351 (1923). By permission of The Macmillan Company, publishers.

Later, as a result of his statistical study of relationships, Spearman added a third kind of factor — group factors that function in the overlapping of *s* factors.[11] Although Spearman's theory gained wide recognition, it also has received criticism because it seems to place emphasis upon inheritance of intelligence to the exclusion of the effects of environmental influences upon an individual's intellectual abilities. Also, his *G* factor appears to be unnecessary in his explanation of behavior evidences of special ability.

The multiple-factor theory. Spearman's statistical analysis of the factors of "intelligence" gave rise to further statistical study in this field. Kelley's work resulted in his conclusion that general intelligence may include such factors as facility or ability in memorizing, number facility, skill with verbal or reading material, visual relationships, and comprehension speed.[12]

Thurstone extended the Spearman two-factor theory into a multiple-factor theory that includes thirteen factors, seven of which are considered to be primary mental abilities: (1) number facility, (2) memory, (3) ability in verbal relations, (4) ability to visualize space, (5) ability to deduce from presented data, (6) speed of perception, and (7) problem solving.[13] These "factors" should not be considered as separate entities of a complex intellectual process but as the observable aspects of mental activity as it functions in an individual's behavior. Stoddard's "attributes of intelligence" referred to earlier present a different analysis of intelligent behavior. Stoddard recognizes the unity that must exist among these attributes if behavior is to be accepted as generally intelligent, and he stresses the goal-stimulated or problem-solving aspect of behavior that is intelligent.

Thorndike's quantity theory of intelligence. As the result of his experimental study of the behavior of animals and children in learning situations, Thorndike developed his well-known hypothesis that "quality of intellect depends upon quantity of connections of neural connectors." His theory is expressed in his famous stimulus-response explanation of behavior in terms of the effect of the stimulus upon the organism. Learning of new material is made easier as a result of the number of bonds similar

[11] See C. Spearman, *The Abilities of Man*, p. 82. The Macmillan Company, New York, 1927.
[12] See T. L. Kelley, *Crossroads in the Mind of Man.* Stanford University Press, 1928.
[13] See L. L. Thurstone, *Primary Mental Abilities.* University of Chicago Press, 1938.

to those needed in the present situation that already have been formed and strengthened through use. It is through the presence of "identical elements" that transfer of training is made possible. In this connection Thorndike says:

The hypothesis which we present and shall defend admits the distinction in respect of surface behavior, but asserts that in their deeper nature the higher forms of intellectual operation are identical with mere association or connection forming, depending upon the same sort of physiological connections but requiring *many more of them.* By the same argument the person whose intellect is greater or higher or better than that of another person differs from him in the last analysis in having, not a new sort of physiological process, but simply a larger number of connections of the ordinary sort.[14]

Thorndike's theory has been criticized as placing too much emphasis upon the fact that a person's degree of observable behavior depends upon the number of connections in the brain and nervous system as a *sine qua non* of his intellectual activities. The theory would seem to make no provision for flexibility in the whole pattern of intellectual life.

Thorndike further concludes that there probably is no general mental ability as such. Language tests such as those commonly used in attempts at measuring the intelligence of children deal mainly with *abstract* intelligence. Thorndike claims that a person may be relatively unsuccessful in his responses to purely academic material but may possess a relatively high degree of ability to deal with concrete material (*mechanical* intelligence), or possess facility in recognizing and applying psychological principles of human relationships (*social* intelligence). It is true that different kinds of intelligent behavior are evidenced by different people in their degree of success in meeting situations that involve abstract, concrete, or social elements respectively. Hence this theory has been accepted rather generally by students of human behavior. The ideal person would be the one, of course, who combined in his general behavior pattern a high degree of superiority in all three of these phases of intelligent behavior.

Whatever theories may be advanced in explanation of the inherent mental abilities of an individual, there is an increasing

[14] From E. L. Thorndike *et al., The Measurement of Intelligence,* p. 415. Bureau of Publications, Teachers College, Columbia University, 1927.

tendency at present to place the emphasis upon ability to do rather than upon the possession of certain more or less unrelated inherent entities. Whitmer expresses this point of view in the following:

We may first refute any assumption that mental tests have any mysterious power of detecting intelligence as an entity apart from life performance. There is no such measure at present, and the probability is that there never will be any direct measure of intelligence. In fact, it is very doubtful if there is any such entity as intelligence. It is much more defensible to say that a person *acts intelligently* than to say that he has *intelligence*. The term "intelligent behavior" is a description of behavior under certain conditions. We can generally agree on what behavior is intelligent even though we might never agree about the existence of some mysterious "intelligence" within the individual.[15]

FACTORS AFFECTING INTELLIGENT BEHAVIOR

Inheritance of intellectual capacity. In Chapter 5 were presented some of the evidences that biologists and psychologists have presented to show that the factor of biological inheritance exercises a significant influence upon an individual's ability to engage in activities that are predominantly mental in nature. Results of numerous studies to determine resemblance between parents and children, siblings (especially twins), and relatives living apart do not offer conclusive evidence that the biological factor influences overt behavior to the extent that hereditarians would like to believe it does.[16]

In order to accept the conclusions of those research workers who tend to place considerable emphasis upon the inheritance factor, one would need to know a great deal more concerning the possible effect upon behavior of environmental conditions and influences. If an individual is to engage in activities involving the higher intellectual processes, the constitutional capacity to do so must be present. Superior stock is basic to the creation of superior organisms. The eugenist is interested in bettering the mental abilities of human beings through inheritance by way of superior germ plasm. This is important if we are interested in producing more and more intellectually superior individuals.

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[15] From C. A. Whitmer, "Has Man Measured His Intelligence?" *University of Pittsburgh Quarterly*, Autumn Issue, No. 9, pp. 38–39 (1941).

[16] See references in Chapter 5, pp. 68–70.

It might be expected that hereditary limits show themselves more definitely during the early school years, since previous experiences have not yet become so important as factors of influence. Yet, rate of growth also must be considered. Rate and limits of development tend to follow a consistent pattern, i.e., the slower the maturational rate is the sooner its limit is reached. There are instances, however, of relatively slow early rate followed by rapid acceleration, and *vice versa.*

Mental defect usually is more easily discovered during childhood than is mental superiority. The child who is mentally retarded by nature tends (1) to be oversuggestible, (2) to select younger children as playmates, (3) to lack ability to concentrate on any except simple tasks, and then only for short periods of time, (4) to be dull or slow in his reactions, and (5) to have mentally retarded brothers and sisters. Contrariwise, the mentally superior child exhibits the following characteristics. He (1) possesses the power of sustained attention, (2) has a large vocabulary, used with precision, (3) is keenly observant and responds quickly, (4) asks many questions, and (5) is original in his thinking.[17]

Regardless of the inherited capacities of a child, the environmental influences by which he is surrounded and which act as stimulating forces of intellectual activity also need to be of the best. There can be no quarrel concerning the importance of both eugenics and euthenics as means of improving the intellectual status of a people. An individual's degree of intelligent behavior at any stage of his development is the resultant of interactions between inherited factors of intelligence (the mental limitations set by nature) and all the factors of experience by which the individual is stimulated and to which he responds. Until or unless there is developed a race of intellectual supermen, however, it is the function of educators to encourage to the utmost whatever intellectual capacities the learners of the present possess.

Influence of environmental factors upon intelligence. As is true in any other area of growth, intellectual development responds to the influence of nurture. Although dull children probably cannot be made bright and bright children tend to remain bright, there are evidences to the effect that an im-

[17] See Ruth Strang, *An Introduction to Child Study,* Third Edition, pp. 522–529. The Macmillan Company, 1951.

proved environment helps a child to do more with whatever potentiality he may possess than would be true if his environment were meager and impoverished. A child may be born with a high degree of potential ability to act intelligently, but unless he is stimulated through learning to exercise that capacity he may appear to be relatively dull or retarded.[18]

Studies have been made concerning the effect of nursery school and kindergarten attendance upon the mental ability of young children. Goodenough's study of twenty-eight children who had attended nursery school as compared with a non-attending control group shows a slight advantage in the improvement of intelligence for the nursery school group.[19] Other studies by Barret and Koch, Waring, and Wellman seem to give evidence of gain in mental ability as a result of preschool training.[20]

The discrepancies among the results of these and other studies in this area probably can be traced to such factors as different programs and teaching techniques in respective nursery schools; lack of completely reliable techniques for the measurement of the intelligence of young children; and differences in home experiences that are likely to exist among the children studied. These and similar factors cause findings, either positive or negative, to offer no conclusive evidence concerning the relative significance of nature and nurture in the development of intelligent behavior during the early years of life.

Investigations also have been conducted to discover the effect of enriched school offerings upon the intelligence of elementary

[18] For a summary of studies dealing with environmental influences upon mental development, see the *Psychological Bulletin*, March, 1940.

[19] F. L. Goodenough, "A Preliminary Report on the Effect of Nursery School Training Upon the Intelligence Test Scores of Young Children," *Twenty-Seventh Yearbook of the National Society for the Study of Education*, 1928, Part I, Chapter XVI, pp. 361–369. See also, by the same author, "New Evidences on Environmental Influence on Intelligence," Chapter XI; and "Some Special Problems of Nature-Nurture Research," Chapter XII, *Thirty-Ninth Yearbook of the National Society for the Study of Education*, 1940, Part I.

[20] H. E. Barret and H. L. Koch, "The Effect of Nursery-School Training Upon the Mental-Test Performance of a Group of Orphanage Children," *Pedagogical Seminary and Journal of Genetic Psychology*, 37: 102–122 (1930). E. B. Waring, "A Report of the Psychological Examinations of Preschool Children in the Nursery School Over a Period of Eight Years," *Ten-Year Report of Studies in Child Development and Parent Education*, Cornell University Agricultural Experimental Station Contributions, Home Economics Bulletin, 1935, No. 638, pp. 42–43. D. L. Wellman, "The Effect of Preschool Attendance Upon the I.Q.," *Journal of Experimental Education*, 1: 48–69 (1932).

school children. One such study dealt with 111 children below average in intelligence who were taken from regular public school classes and provided with enriched school curriculums and experiences in a special school. After two or more years of engaging in superior educational activities these children as a group showed little if any gain in intelligence.[21]

Other studies give little if any more evidence that the intelligence level can be raised to any great degree, except in isolated cases, through improved educational offerings. Testing techniques are not yet sufficiently perfected and the problems involved in determining the effect of environment upon intelligence still are so complicated that it is difficult to arrive at any specific or definite conclusions in the matter. In general, such factors as good health status, affectionate care, feeling of security, and challenging learning stimulation suited to the growth stage of the child probably affect his ability to reflect in his behavior whatever capacity he possesses for intelligently directed responses.

GROWTH OF INTELLIGENCE

Constancy of growth. On the average, the growth of the mental ability of any individual is fairly regular in rate, and the degree of intelligence from age period to age period is relatively constant. As in the case of physical growth, the rate is more rapid during the early years and then levels off gradually until intellectual maturity is reached. The chronological age at which an individual reaches his full mental maturity varies, according to Pintner, from 14 years to 22 years.[22] As a result of his work with the Binet tests, Terman set 16 years as the limit of mental growth.[22] Thorndike suggests that ability to learn may continue to increase until the age of 22, and, moreover, that adults may continue to profit equally well from learning experiences at 45 years as they do when they reach their zenith at 22.[23] In this

[21] M. C. Pritchard, K. M. Horand, and L. S. Hollingworth, "The Course of Mental Development in Slow Learners Under an 'Experience Curriculum,'" *Thirty-Ninth Yearbook of the National Society for the Study of Education*, 1940, Part II, Chapter XVI, pp. 245–254.

[22] See R. Pintner, *Intelligence Testing, Second Edition*, Chapter X, Henry Holt and Company, New York, 1931. Also L. M. Terman, *Measurement of Intelligence*, Houghton Mifflin Company, Boston, 1916.

[23] See E. L. Thorndike *et al.*, *Adult Learning*. The Macmillan Company, New York, 1928.
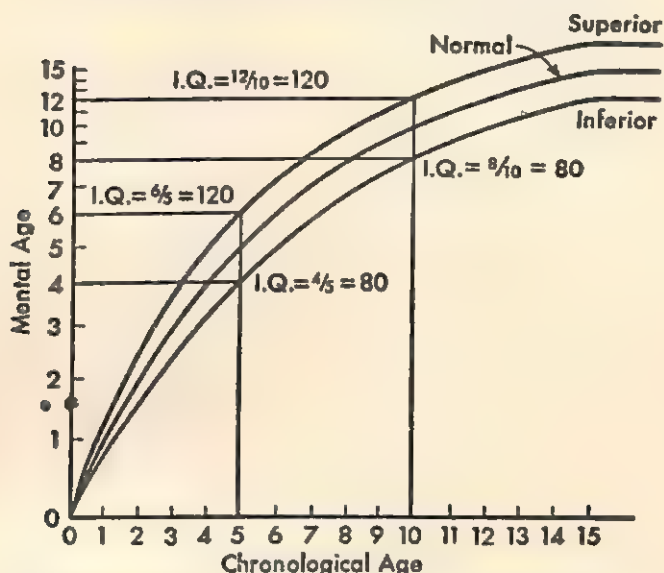
FIGURE 10. *Hypothetical Growth Curves Which Give a Constant I.Q.*

From H. E. Garrett and M. R. Schneck, *Psychological Tests, Methods, and Results*, Part Two, p. 15. Copyright, 1933, by Harper and Brothers.

connection, it may be noted that beliefs to the effect that there is a gradual decline in ability to learn with the approach of so-called old age do not seem to be substantiated entirely by observable facts. Among the "bright" at least, an increasing number of older persons give evidence of clear and logical thinking and the ability to adapt to new situations unless their efforts are hampered by a physical defect, such as failing eyesight.

In general, growth in intelligence continues at a more rapid rate and reaches a greater height for the bright than for the great mass of individuals considered average or normal. The growth rate of the slow or retarded and feeble-minded progresses more slowly and reaches its limit sooner and at a lower level than do the others. Figure 10 indicates the direction which the mental growth curve would take to give a constant I.Q. for the superior, normal, and inferior, respectively. Fluctuations in the growth rate usually are slight. Some children tend to develop a little more slowly than others during their early years, but then "catch up" with themselves. Others make a good start and then are slowed down, temporarily at least. Factors such as sickness, changed environmental conditions, and emotional disturbance may be responsible for whatever fluctuations show themselves

in individual curves that have been constructed on the basis of periodic tests of intelligence adequately administered.

Differences in mental growth among groups. *Sex differences.* Contrary to popular opinion, boys and girls tend to show little if any differences in intelligence as measured by tests of mental ability. There may be greater variability among boys and men than among girls and women.

A study by Witty [24] of the relative intellectual ability of secondary school pupils produced the data given in Table V. His findings would seem to indicate that sex difference is relatively small on the secondary level at least. Apparent differences between the sexes in the ability to achieve success in certain areas of study and work must be traced to circumstances such as traditional attitudes, developed interests, and opportunities to succeed. [25]

TABLE V.   *Distribution of Scores of 27,642 High School Pupils (From Witty)*

I.Q. GROUP	NUMBER		PERCENTAGE		RATIO OF BOYS TO GIRLS
	BOYS	GIRLS	BOYS	GIRLS	
140 and above	47	48	.322	.354	.938
130 to 139	250	244	1.767	1.810	.976
120 to 129	1,237	1,103	8.742	8.175	1.069
110 to 119	3,013	2,972	21.294	22.026	.967
100 to 109	3,896	4,080	27.536	30.238	.911
90 to 99	3,573	3,356	25.253	24.872	1.015
80 to 89	1,713	1,394	12.106	10.331	1.172
70 to 79	369	260	2.608	1.927	1.353
Below 70	51	36	.360	.267	1.348
Total	14,149	13,493	99.998	100.000	

Racial differences. Studies by Brigham concerned with a comparison of the intelligence of Nordics (English, American, Scotch, and German stock) with the intelligence of members of other national groups (such as Italians, Poles, Greeks, and Russians) led to the conclusion that Nordics are superior in

[24] From P. A. Witty, "Relative Frequency of Gifted Boys and Girls in the Secondary Schools," *Educational Administration and Supervision*, XX: no. 8 : 606–612 (1934). By permission of the publishers.

[25] J. R. Hobson, "Sex Differences in Primary Mental Abilities," *Journal of Educational Research*, XLI: no. 2 : 126–132 (October, 1947).

intelligence to other national groups.[26] These studies did not take into account factors other than intelligence — differences in cultural backgrounds, unfamiliarity with our traditions, and the like. Consequently, the findings of these studies no longer are accepted, although the myth of Nordic superiority still is accepted by many laymen.

Comparative studies of "whites" and other racial groups that seem to give the advantage to the former also should be questioned. Few if any studies are based upon a comparison of "pure" stock with "pure" stock. Also, the differences that may seem to exist possibly can be explained in part at least in terms of environmental influences, some of them very subtle in their effect. The "bright" and the "dull" can be found in any group.[27]

DISTRIBUTION OF MENTAL ABILITY

The normal curve. Differences in mental ability of unselected individuals tend to distribute themselves in the form of a normal curve. There are no gaps between groups of individuals arranged according to their relative degree of intelligent behavior. Human beings show a wide range of demonstrated intelligence. When the mental abilities of a large unselected group are measured, it is found that the I.Q.'s obtained from the measurement range from almost complete idiocy to very superior performance.

Alfred Binet classified degrees of mental ability in terms of mental ages as ascertained by performance on test material that could be expected (as a result of his many studies) to be characteristic of this or that stage of development. Terman carried Binet's work a step further by relating the mental age of an individual to his chronological age. For example, if a child who is exactly ten years old chronologically performs on a test as a child of exactly ten years of age can be expected to perform, the child's mental age also is ten years. Hence, in this case, mental age and chronological age agree and the child has normal

[26] C. C. Brigham, *A Study of American Intelligence*, Princeton University Press, 1923. Also C. C. Brigham, "Intelligence Tests of Immigrant Groups," *Psychological Review*, XXXVII : no. 2 : 158–165 (1930).

[27] See P. A. Witty and M. D. Jenkins, "Intra-Race Testing and Negro Intelligence," *Journal of Psychology*, I : 179–192 (1936). Ruth Benedict, *Race: Science or Politics*, Modern Age Books, New York, 1940. E. Hilgard, *Introduction to Psychology*, Second Edition, Harcourt, Brace and Company, 1957.

mental ability for his age. If, however, the ten-year-old child performs on the twelve-year-old level, he is to that extent superior in intelligence to his age group.

Terman compared the chronological age (C.A.) and the arrived-at mental age (M.A.) in terms of a formula in order to express numerically the degree of relationship between the two. To refine this relationship, both the M.A. and the C.A. are expressed in months, and to avoid decimals the percentage equivalent is multiplied by 100. The resulting numerical relationship is called the *intelligence quotient* or I.Q. The formula applied by Terman is the following:

$$\frac{\text{M.A. (months)}}{\text{C.A. (months)}} \times 100 = \text{I.Q.}$$

For purposes of comparison, I.Q.'s are generally classified according to the scheme that is used in Table VI and Figure 11. The data presented here represent the results of the application of the revised Terman and Merrill form of Terman's adaptation of the Binet Tests for use with American children and commonly called the Stanford-Binet Scale.

TABLE VI.   *Distribution of Intelligence Quotients in a Normal Population*

CLASSIFICATION	I.Q.	PERCENTAGES OF ALL PERSONS
Near genius or genius	140 and above	0.25
Very superior	130–139	0.75
Superior	120–129	6.00
Above average	110–119	13.00
Normal or average	90–109	60.00
Below average	80–89	13.00
Dull or borderline	70–79	6.00
Feeble-minded: moron	50–69	0.75
imbecile, idiot	49 and below	0.25

From H. A. Greene, A. N. Jorgensen, and J. R. Gerberich, *Measurement and Evaluation in the Secondary School*, p. 233. Copyright, 1946, by Longmans, Green and Company. As adapted from Terman and Merrill, *Measuring Intelligence* (Houghton Mifflin).

Interpretation of individual performance. The fact that there are no breaks in a normal curve of distribution for mental abilities should make us cautious in our designation of a person
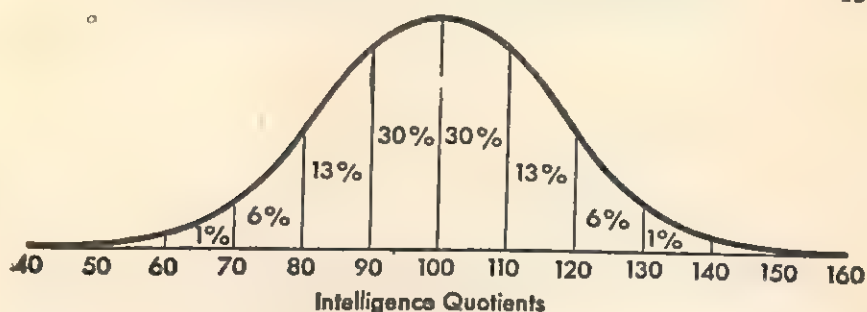
FIGURE 11. *Percentage of Persons in a Normal Population at Different Levels of Intelligence*

From H. A. Greene, A. N. Jorgensen, and J. R. Gerberich, *Measurement and Evaluation in the Elementary School*, p. 233. Copyright, 1946, by Longmans, Green and Company. (As adapted from Terman and Merrill.)

as belonging definitely in one classification or the next. Certainly there is wide difference of ability between the moron and the superior individual. What about the above-average individual with an I.Q. of 110, and the normal or average whose I.Q. is 108 or 109? Too often teachers fail to take into account the significance of I.Q. point-range in any classification. Technically, the child with an I.Q. of 90 and the child whose I.Q. is 109 are both normal or average. However, there is a definite difference between these two children in ability to learn. In judging a child's ability in terms of these classifications, therefore, relative place in any given range as well as the range itself is important.

Moreover, repeated performance by an individual even on a second form of the same intelligence test may yield results that vary from one to ten points either way without any observable change in the individual's ability to perform. Although the normal curve presents general trends in the mental abilities of large unselected groups, individuals or groups of individuals may vary to some degree in terms of environmental influences or other factors. Figure 12 shows the distribution of I.Q.'s of two groups of school children — urban and rural. Although the general performance of the urban group appears to be superior to that of the rural group, there are bright, average, and dull youngsters in both groups. Also, successful achievement in so-called intellectual activity is not dependent upon the I.Q. alone. Home conditions, degree of interest, emotional attitudes, health, and other factors may affect individual success during the taking of an intelligence test or in learning achievement.
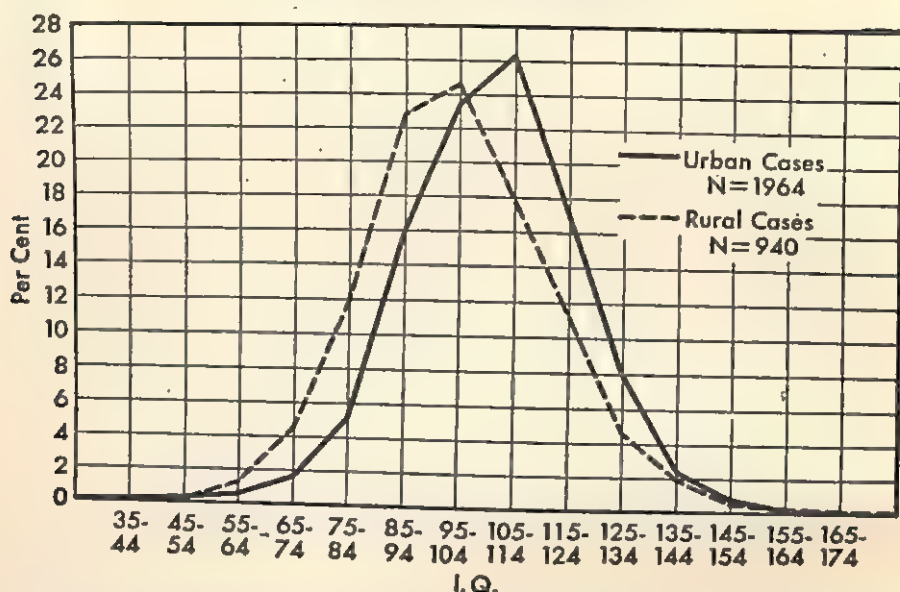
FIGURE 12. *Distribution of I.Q.'s of Rural and Urban Groups on the Revised Stanford-Binet Scale*

From L. M. Terman and M. A. Merrill, *Measuring Intelligence*, p. 49. Copyright, 1937, by Houghton Mifflin Company.

It is a recognized fact that demonstrated achievement in school learning does not always parallel degree of intelligence as determined by the administration of intelligence tests. The dull or retarded pupil may seem to perform a little more successfully than his I.Q. would appear to warrant. Also, superior children may fall much below their supposed intelligence level in their observable degree of success in school studies, as can be seen in Table VII. This table presents the I.Q.'s obtained from the application, under favorable conditions, of a reliable intelligence test and the achievement averages earned during four years of study on the high school level of 2636 graduating seniors of a New York City high school.

A study of the table shows that, in general, the median I.Q. for each achievement group rose steadily from 98 I.Q. for the 65% to 69% achievement grade group to 133 I.Q. for the 90% to 100% achievement grade group. It is also interesting to note that no student with an I.Q. below 85 achieved more than 74% as a school average. However, the same is not true of the bright students, since one in the 130–139 I.Q. group earned less than 70% as an achievement average for the four years, and 35

others ranging in I.Q. from 110 to 125 fell in the lowest achievement group.

TABLE VII.   *I.Q.'s and School Averages of 2636 High School Graduates*

I.Q. OF PUPILS	NUMBER OF PUPILS WITH SCHOOL AVERAGES OF						
	65%*– 69%	70%– 74%	75%– 79%	80%– 84%	85%– 89%	90%– 100%	TOTAL
140 and up		1	1	13	11	14	40
130–139	1	8	11	34	49	17	120
125–129		15	43	65	42	8	173
120–124	1	41	64	66	46	7	225
115–119	10	102	115	78	38	4	347
110–114	24	121	112	44	25	2	328
105–109	70	177	102	35	13		397
100–104	82	175	90	25	6		378
95–99	102	125	52	9			288
90–94	66	94	20	3			183
85–89	59	43	7				109
80–84	25	11					36
75–79	8	4					12
Total	448	917	617	372	230	52	2636
Highest I.Q.	135	141	145	157	156	158	158
Median I.Q.	98	108	112	119	129	133	110
Lowest I.Q.	75	76	86	90	100	111	75

* 65 is the passing mark.

THE MEASUREMENT OF INTELLIGENCE

Importance of measurement. The student of educational psychology is concerned with the educational implications inherent in the use and interpretation of techniques for the measurement of mental ability rather than with the many details of specific test content, and the selection, administration, and recording of test results. Although we may not be entirely satisfied with all the testing techniques now available, it cannot be denied that the history of the development of intelligence tests during the past half century is remarkable and that brilliant work has been done in this field.

There probably is no "perfect" test of intelligence. Mental abilities are far too complex to be measured adequately by any one or more tests yet constructed. The Terman-Merrill revised

Stanford-Binet Scale is accepted widely as yielding what may be considered the most satisfactory measure of an individual's mental capacity from the age of two to adulthood. This scale is described in more detail later. The results of all tests, including the one mentioned, may be affected by many factors inherent in the testing conditions, the child's background of experience, and other favorable or unfavorable elements. Hence no administrator, teacher, or student of education should accept test results as the only measure of an individual's degree of ability to learn. Nor should test results be taken lightly and ignored in any prediction of future learning success or achievement in other fields. In any situation, in school or out of school, where competence is required, social understanding, emotional stability, and drives to action, and other personal factors are as significant to successful achievement as is degree of mental ability.

A consideration of mental measurement should develop an attitude of fair-minded appreciation of its value. It should be realized that the results of intelligence tests combined with other techniques available for the evaluation of learning success can help a teacher to discover what the child can learn and how quickly he can learn, as well as the teaching methods that should be applied and the learning content that should be utilized to guide the learner to use his mental potentialities to their utmost. To this end a brief consideration will be given to some of the general facts concerning the measurement of intelligent behavior.

Beginnings of intelligence testing. Test construction began with Alfred Binet's attempt to devise an instrument of measurement that could be used for the discovery of feeble-minded children in French schools. The first Binet-Simon test appeared in 1905, with revisions in 1908 and 1911. This is an individual test of performance, and its scores are interpreted in terms of mental age.

American revisions and adaptations of the Binet test were published by Goddard (1911), Kuhlmann (1912), and Terman (1916). The last was revised in 1937 by Terman and Merrill. As in the administration of other individual tests (many of them adapted from the Binet-Simon test), it is important that rapport be established between the tester and the individual tested. Directions are given orally, and responses are oral, written, or

manipulatory. Complete understanding on the part of the child concerning the meaning of the question or problem and cooperative response are needed if the results of the tests are to be reliable. Examples of the items included in the Terman-Merrill revision of the Stanford-Binet Scale (Form L) are presented below:

Year II

- Three-Hole Form Board
- Identifying Objects by Name
- Identifying Parts of the Body
- Block Building: Tower
- Picture Vocabulary
- Word Combinations

Year V

- Picture Completion: Man
- Paper Folding: Triangle
- Definitions
- Copying a Square
- Memory for Sentences II
- Counting Four Objects

Year XII

- Vocabulary
- Verbal Absurdities II
- Response to Pictures II
- Repeating Five Digits Reversed
- Abstract Words II
- Minkus Completion

Superior Adult III

- Vocabulary
- Orientation: Direction III
- Opposite Analogies II
- Paper Cutting II
- Reasoning
- Repeating 9 Digits [28]

Although at first glance the items included in these tests appear to be simple and easy to apply, intensive training is needed in their administration and in the interpretation of their results if practical use is to be made of them.

The testing of the intelligence of individuals in groups rather than singly (commonly referred to as group intelligence testing) began in America during World War I with the use of the Army Alpha Tests for literates and the Army Beta Tests for illiterates and non-English-speaking servicemen. These tests were constructed and utilized for the purpose of selecting men for various types of service, including recruits for officers' training. During the years 1918 to 1925 many psychologists, led by Terman and Otis, constructed group tests that were patterned upon the Army Alpha and were intended for use with school children. Relatively few new tests appeared during the period 1925 to 1935. During recent years, however, we have experienced another wave of intelligence test construction.

[28] From L. M. Terman and M. Merrill, *Measuring Intelligence*, pp. 75–132. Copyright, 1937, by Houghton Mifflin Company.

Types of tests of mental ability.   Intelligence tests can be classified, with overlappings, as (1) individual or group; (2) language or verbal, nonlanguage or nonverbal, or performance; (3) simple or more difficult, as adjusted to age or school levels.

Individual and group tests. The differences between individual and group tests already have been noted. The individual test is administered to *one* person at a time, and the subject's responses may be oral or written. During the administration of an individual test, the tester must be objective in his manner and alert to the behavior of the child tested as the latter responds to specific questions or attempts to carry out suggested directions.

The conduct of the examiner during the administration of a group test also is very important. He should be thoroughly acquainted with the test and the manual of directions. Materials, including pencils, should be prepared ahead of time for distribution. Directions should be given clearly and distinctly, and timing should be exact. The entire testing procedure should be quiet and dignified, and aimed at reducing to a minimum any tension or fear that may be present among the persons to be tested.

Language and nonlanguage tests. Language or verbal tests attempt to discover the extent to which the subject has mastered reading material appropriate to his level of learning and require that the subject respond in writing (usually by word, symbol, cross, check, underlining, or circling). Many of the intelligence tests now in use are based on materials similar to those included in the Army Alpha test: (1) following directions, (2) arithmetical problems, (3) practical judgment, (4) synonym-antonym, (5) disarranged sentences, (6) number series, (7) analogies, (8) information.

In some tests the items are arranged according to the type of material included. In others the various types of material are thrown together so that the items are scaled according to degree of difficulty. Language tests usually are referred to as tests of abstract intelligence. The reader probably is acquainted with group tests of this kind as a result of having had one or more of them administered to him.

Nonlanguage or performance tests are useful in measuring the degree of mental alertness of persons who, for one reason or another, may have difficulty in reading the English language.

The materials and procedures utilized in nonlanguage or performance tests include activities such as completing pictures; discovering absurdities in a picture; correctly arranging pictures, words, or symbols; making substitutions as in the code substitution test; correctly marking a path in a labyrinth of lines or a maze. Some psychologists claim that performance tests are likely to offer a better measurement of mental abilities apart from learning than do the language tests.

Tests for different age or grade levels. Tests on the lower age and grade levels include much picture material, deal with simple relationships, and require relatively little time to administer. Because of the likelihood that a young child's responses will be variable, his scores on successive tests probably will fluctuate. However, if tests are well administered to a child at age three or four and again at age six or seven the chances are good that there will be a fair amount of agreement between success in performance on the two age levels.

Tests on late elementary school, high school, and college levels increase in difficulty from level to level and demand greater ability to deal with more material that becomes gradually more abstract. It is frankly admitted by most test constructors that the questions on these levels are based upon material that at any stage of development should have been learned previously by the individual who has been exposed to learning situations appropriate to his age and grade and shared with other individuals of his kind.

It is assumed, for example, that an individual who is expected to take a group intelligence test written in the English language has had experience in reading and comprehending the English words and phrases in the test appropriate to his particular age or grade status. A foreign-language-speaking child who has not gained a sufficient command of English to make the meaning of the test questions clear to him should have administered to him a performance test or a nonlanguage test, such as the revised Army Beta Test.

Methods of interpreting intelligence test results. The concept of mental age as introduced by Binet is a helpful technique in the interpretation of raw test scores. For example, if an intelligence test consists of ninety items, it is possible to ascertain through the administration of the test to a large number of

unselected individuals in the age range for which the test has been devised the frequency of correct responses at each age level, i.e., 14 years 2 months, 15 years 4 months, etc. If the majority of subjects whose age is 14 years 2 months completed successfully forty-two of the ninety questions, then any individual who earns a score of 42, regardless of his chronological age, is said to have a *mental age* of 14 years 2 months.

In order to facilitate the estimating of the rate of mental development of any one individual, the ratio between mental age and chronological age can be determined and reported as the intelligence quotient or I.Q. The intelligence quotient as a means of estimating the degree of mental development has great value if it is interpreted wisely as *one* indication of a learner's probable future success in learning. The intelligence quotient as a measure of prediction is most useful during the middle and upper grades of elementary school and high school years.

As an individual approaches maturity the value of the intelligence quotient becomes less significant, mainly because of uncertainty as to the proper chronological age to accept as indicative of maturity. In computing the I.Q., shall the denominator (C.A.) be 14, 16, 18, 20, or 22? At what age can it be assumed that the individual has achieved mental maturity? Although many psychologists use 16 as the age of assumed maturity, there is no assurance as yet that this age is correct.

There is a growing trend toward representing intelligence status in forms other than M.A. or I.Q. The *Index of Brightness* as used by Otis [29] is expressed as a positive or negative deviation of a pupil's score from the norm for individuals of his chronological age group. On the high school and college levels, an individual's intelligence status sometimes is expressed in terms of *percentile scores*, which indicate the place of an individual in a grade or age group on the basis of the percentage of the group that scores lower than he does, i.e., he may be in the lowest percentile, the highest percentile, the thirtieth percentile, etc. In some cases the scores of the group are ranked and divided into deciles and the individual then falls in the 3rd, 5th, 10th decile, etc. Percentile norms are used for interpretative pur-

[29] See A. S. Otis, *Manual of Directions for Gamma Test: Otis Quick-Scoring Mental Ability Tests*, New Edition, p. 4. World Book Company, Yonkers-on-Hudson, N. Y.

poses on such tests as the American Council on Education Psychological Examinations.

Comparison of learning success and degree of intelligence. Throughout this discussion reference has been made to the fact that the results of intelligence testing are helpful aids in determining what can and should be expected of learners as they progress, step by step, through their learning experiences. The relation between intelligence and school achievement probably varies from a coefficient of correlation of .30 to .75. (See Chapter 20 for meaning of coefficient of correlation.) In general, as indicated in the study of I.Q.'s and high school averages (p. 159) there is apparent a line of agreement between the two.[30] This relationship seems to be closest during middle childhood, becoming less during college years. The discrepancy often found between mental ability and learning success among college students may be caused by the presence of such factors as spread of individual interest, specific ambitions, differences among instructors in evaluating achievement, techniques of teaching used in the classroom, and other variables.[31]

Lamson's study of the superior achievement of bright high school students in the New York Regents' examination as compared with school records substantiates the general opinion of school people that the bright may be expected to earn greater success in school work than would the dull in the same learning situation.[32] However, there may be overlapping in some learning areas, especially in learning concerned with motor skills and in simple mental activities. Pyle and Snadden discovered such overlappings in a study conducted with senior high school pupils of Detroit, working with ideational tests and three or four motor learning tests.[33]

T e is some disagreement among school people concerning the extent to which the mental ability of an individual should be considered in an evaluation of achievement in learning mate-

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[30] See also F. B. Bolton, "Value of Several Intelligence Tests for Predicting Scholastic Achievement," *Journal of Educational Research*, XLI: no. 2: 133–141 (October, 1947).

[31] Sister M. Florence Louise, "Mental Growth and Development at the College Level," *Journal of Educational Psychology*, 38, no. 2: 65–82 (February, 1947).

[32] E. E. Lamson, "High School Achievement of 56 Gifted Children," *Journal of Genetic Psychology*, 47: 233–238 (1935).

[33] W. H. Pyle and G. H. Snadden. "An Experimental Study of Bright and Dull High School Pupils," *Journal of Educational Psychology*, 20: 262–269 (1929).

'rials suited to his mental level. For example, in one school, pupils who had a high degree of ability to learn, as evidenced by their superior I.Q. and their successful achievement as compared with the achievement of normally intelligent pupils, were segregated in "honors" classes. Although in such classes these bright young people successfully mastered the more advanced and enriched program of studies, their final grades were lower than they had been in previous "normal" classes. The assumption on the part of their teachers was that it was impossible for these pupils to achieve as well in a more difficult situation as in an easier one.

Another question that arises concerning the relationship that exists between degree of ability to achieve and actual achievement is whether dull children who are given a modified program of studies suited to their level of mental ability should be rated in terms of their *actual* degree of success or on the basis of what could be expected on the same level of learning by normal children. One principal directed her teachers to assign no grade over 80 per cent to a pupil taking a modified course, no matter how excellent the performance. The reason given was that later in life these dull children may need to compete with individuals more able than themselves. Hence they should not be allowed to acquire false notions concerning their chances of success in normal situations. Shall school marks take into account the intelligence level of learning, or shall they be assigned in terms of normal standards of achievement?

QUESTIONS AND TOPICS FOR DISCUSSION

1. Select from the definitions of intelligence presented in this chapter the one you consider to be the best. Formulate your own definition.
2. State present-day attitudes toward the relative influence of nature and nurture upon intellectual ability. Substantiate by reference to studies in the field.
3. If possible, obtain the I.Q.'s and final term marks of a group of elementary school children. Prepare a distribution table of the data similar to Table VII.
4. By reference to reports of specific studies concerning differences in intelligence between the sexes, formulate an answer to the contention that men are superior to women.
5. "All delinquents are below average in intelligence." Evaluate the truth of this statement.

6. Differentiate between M.A. and I.Q. If you were a school principal planning to reorganize your school in terms of levels of mental abilities, which measure would you use — M.A. or I.Q.? Defend your decision.

7. List five everyday activities in which degree of intelligent behavior can be recognized. Explain.

8. If I.Q. is supposed to be fairly constant, how do you explain fluctuations in individual rates of mental development?

9. Compare Thurstone's and Thorndike's theories of the nature of intelligence. Which is quantitative and why?

10. What are the advantages and disadvantages of individual tests of intelligence as compared with group tests?

11. Illustrate each of Stoddard's seven attributes of intelligence by reference to the behavior of children and your own behavior.

12. What chronological age do you think should be used in computing the I.Q.'s of adults? Why?

13. Why is percentile rank probably the best numerical expression of the intelligence status of college students?

14. Why are intelligence test results for young children likely to be less reliable than those for older children?

15. Justify the inclusion in the content of an intelligence test of the seven types of questions that appear in the Army Alpha tests. Name other types of questions that you believe should be included.

16. How would you answer the last question in this chapter? Justify your point of view.

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9

APTITUDE AND APTITUDE TESTING

AN individual usually is more
adept in one field of activity than in others. He also may give
evidence of superiority over other individuals in that particular
ability. It is easy to credit the person who possesses a special
talent or aptitude with having fallen heir in some mysterious
fashion to a "gift," the possession of which has been denied to
others.

It would be foolish to deny that people differ from one another
and within themselves in their observable degree of achievement
in one or another field of performance, such as music, art,
mechanics, public speaking, leadership, or facility with figures.
The bases of these differences, the extent to which they are
inborn or the result of training and experience, and their dis-
covery as a starting point of continued education are extremely
important. The educational program that is devised for any one
learner needs to take into account not only his general ability to
learn but also any special ability or aptitude which he may
possess and for which special training should be provided.

INTERPRETATION AND FUNCTION OF APTITUDE

Concept. Aptitudes may be considered to be qualities which
all individuals possess in varying degrees. An aptitude also may
be regarded as a special form of superiority in a limited field of
performance, for example, music, mathematics, or mechanics.
Many of the earlier experiments and studies of abilities stressed
some of these general powers to achieve. For example, Cattell

attempted to discover differences among people in the following areas, most of which deal with sensory acuity and muscular power rather than with more complex mental characteristics:

1. Strength of grip.
2. Rate of arm movement.
3. Two-point threshold on the back of the hand.
4. Amount of pressure required to produce pain **on the forehead.**
5. Least noticeable difference in weights.
6. Reaction time to sound.
7. Time required to name ten colors.
8. Bisection of a 50-centimeter line.
9. Ability to reproduce a 10-second interval of time by tapping when subject thinks the interval has elapsed.
10. Auditory memory span for letters.[1]

Three of these tests — strength of grip, color naming, and auditory span for letters — still are in use as measures of special abilities in certain aptitude tests. Cattell also devised tests, administered to the students at Columbia University, which were forerunners of examinations now used with college entrants to measure degree of academic aptitude.

Thorndike's suggestion that an individual may possess three kinds of intelligence (abstract, mechanical, and social) and Spearman's theory of the G and s factors of intelligence are significant as indications of recognition on the part of these psychologists of the presence of special abilities or aptitudes. The present attempts at discovering to what extent special abilities or aptitudes function in better fitting an individual for participation in one vocational field rather than another have grown out of earlier concern with the composites that may be considered as constituting the many complex qualities or traits of an individual. As psychologists consider these special abilities, they are placing emphasis upon what can be included in the term *aptitude* and in what ways the possession of special abilities can be utilized to help an individual meet educational requirements and vocational demands.

Meaning of aptitude. Aptitude is a characteristic or a quality which is one aspect of an individual's whole personality. Bingham defines aptitude as

[1] From J. McK. Cattell, "Mental Tests and Measurements," *Mind*, 15:373–380 (1890).

a condition symptomatic of a person's relative fitness, of which one essential aspect is his readiness to acquire proficiency — his potential ability — and another is his readiness to develop an interest in exercising that ability.[2]

Bingham goes on to state that

An individual's potentialities are not equally strong. . . . Individuals differ one from another in their potentialities. . . . Many of these differences are relatively stable.[3]

He further warns that

aptitude tests do not directly measure future accomplishment. . . . They measure present performance. Then, *in so far as behavior, past and present, is known to be symptomatic* of future potentialities, the test data supply a means of estimating those potentialities.[4]

Traxler's interpretation of an aptitude emphasizes the predictive function of its presence, as he defines an aptitude as

A condition, a quality, or a set of qualities in an individual which is indicative of the probable extent to which he will be able to acquire, under suitable training, some knowledge, skill, or composite of knowledge, understanding, and skill, such as ability to contribute to art or music, mechanical ability, mathematical ability, or ability to read and speak a foreign language.[5]

There is some difference of opinion among psychologists concerning the relationship that exists between an individual's apparent potentialities, as these show themselves in his *present* behavior, and the extent to which *future* achievement may be predicted in terms of present potentialities. Many factors combine to determine what a person may be expected to do in the future, especially in the achievement of educational or vocational success. If a person gives evidence of a high degree of aptitude, *talent*, in a certain field, it is reasonable to assume that training aimed specifically at the development of that talent will result (barring accidents) in superior achievement and consequent success. However, an aptitude, either general or specific, may be regarded as a present state of readiness which, when adequately measured, can function as the basis of further training for or

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[2] From W. Bingham, *Aptitudes and Aptitude Testing*, p. 18. Copyright, 1937, by Harper & Brothers.   [3] *Ibid.*, p. 24.   [4] *Ibid.*, p. 22.
[5] From A. E. Traxler, *Techniques of Guidance*, Revised Edition, p. 49. Copyright, 1957, by Harper & Brothers.

participation in the field of activity in which the individual at the time of the testing appears to give indication of ability to achieve successfully.

Aptitude — inherited or acquired. Special abilities often are regarded by laymen as capabilities with which a person is or is not born. If his native capacity for musical performance or mathematics, for example, is strong enough, he will be able to perform successfully regardless of the amount or kind of training he receives. Contrariwise, according to this theory, if the native tendency is lacking, no amount of training will be able to produce it.

From many points of view the relationship that exists between nature and nurture in the development of special abilities or aptitudes is important. At the present time, however, we know little more about this relationship than what has been emphasized in previous chapters. There seems to be evidence that an individual may reflect to some extent some of the demonstrated abilities or disabilities that have shown themselves in the family line, but whatever a person eventually becomes is the result of a constant interaction between his native endowment and the forces of the environment by which he is stimulated. For the individual himself and for those responsible for his education, the important consideration is not knowing whether or not a particular trait or aptitude is native or the result of early influences, but rather recognizing and utilizing his present abilities as states of readiness for continued education or for participation in this or that vocational or avocational activity.

Aptitude and intelligence. Binet and his successors emphasized the *wholeness* of the functioning of an individual's mental life. The basic assumption underlying the construction of intelligence tests, then, is that, through the measurement of the responses of an individual in different areas of activity, the tester may be enabled to predict the subject's general ability to succeed in mental activities — his general intelligence. Inclusion of different types of material in tests of intelligence would in itself, however, indicate recognition of the presence of differing abilities rather than one consistent unitary pattern of performance.

Without going into a critical evaluation of existing intelligence tests, it can be suggested that even in his responses on a test of general intelligence an individual may give evidence of specific apti-

tude to the extent that he may answer correctly all the questions dealing with, say, mathematical concepts, English concepts, or relationships. Aptitude as such can be considered that phase or area of an individual's mental ability in which he can be expected to continue to improve to a point of exceptional performance. A measure of an individual's general intelligence has predictive possibilities concerning the extent to which he may be able to succeed in a number of situations involving mental activity. Aptitude measurement gives an indication of ability to succeed in a specific field.

Aspects of aptitude. In a discussion of aptitude it is customary to limit the connotation of the term to the application of specific ability in one of many vocational fields. Aptitude can be interpreted to include an individual's degree of ability or development in any one of his many life relationships. Experimental work has been concerned with finding methods by which an individual's "latent aptitudes" can be discovered. For this purpose many different types of tests have been devised: tests of sensory acuity, of motor speed, strength, and coordination; tests of temperament and character; and tests of reasoning and ability to learn. Included in these evaluating techniques may be tests of chemical or physiological reactions and attempts to discover information concerning family achievement or past environmental background.

Tests of ability to learn and of power in reasoning are important as predictors of the kind of learning situations into which a learner should be guided. We are familiar with attempts to discover a child's degree of readiness to learn how to read.[6] An important responsibility of school people is the attempted prognostication of a young person's readiness for this or that field of study on the high school level, such as college preparatory, business, or trade. Much attention is being given to attempts at determining individual degree of readiness for continued learning on the college level, both general and specific.

Achievement itself in any area of learning can be considered an indication of an individual's aptitude. A high school or college student who shows superior ability in science, in art, in mathematics, or in writing, for example, may be expected

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[6] See J. W. Wrightstone, J. Justman, and I. Robbins, *Evaluation in Modern Education.* American Book Company, New York, 1956.
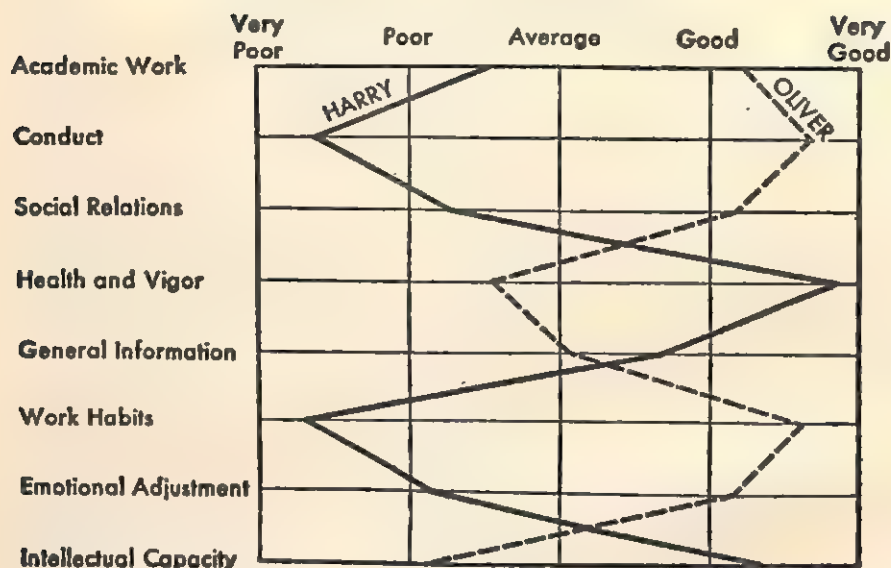
FIGURE 13. *Profiles Picturing the Abilities and Traits of Two Boys, as Indicated by Ratings Made by Their Homeroom Teacher*

From S. L. Pressey and F. P. Robinson, *Psychology and the New Education*, p. 73. Copyright, 1944, by Harper and Brothers.

(other factors being equal) to be exhibiting a high degree of aptitude in one or another particular field. Success in any one field, however, usually is predicated upon many factors beside the possession of a specific ability. Personal attributes and attitudes are likely to advance or to retard successful achievement.

It is a well-known fact that in the business world promotion or dismissal of an employee may rest upon such factors as cooperation, industry, and general ability to adapt to a situation as much as, if not more than, upon demonstrated proficiency in the particular job. This is a fact that should be of great importance to school people. As teachers work with their pupils day-by-day, they are able to discover attitudes and patterns of behavior which, taken in conjunction with demonstrated ability in this or that field, may help or hinder a learner's prospects of successful achievement.

An experienced adult can recognize behavior characteristics of children that are indicative of tendencies that may need to be modified or redirected. An interesting comparison of the observable reactions of two boys in relation to their abilities is shown in Figure 13.

To the extent that the teacher's appraisal of these two boys is trustworthy, it is apparent that here are two individuals whose behavior patterns differ markedly. Both boys need definite guidance if they are to be helped to find a place for themselves in a world of work. The cause of Harry's lack of desirable response in light of his superior mental ability needs to be discovered and eliminated or modified. Oliver's profile gives evidence of the possession of personal characteristics that should lead to success unless the boy is tempted to enter a vocation that demands a degree of intellectual ability beyond that which he possesses.

In a narrower interpretation of the term, aptitude connotes possession of ability or abilities that will fit the individual to earn success in a vocational field for which he appears to be suited in terms of the actual requirements of the job itself. As has been noted earlier, to what extent existing aptitude, as judged from the results of specific aptitude tests, can be accepted as an inference of future success still has not been determined conclusively, mainly because of the complex nature of any except the simplest of skills.

Attention to the integration of factors rather than a consideration of each factor separately probably is necessary for aptitude prediction. Many occupations demand the possession of similar abilities. Some vocational fields require that the worker possess aptitude for careful, detailed performance as well as specific aptitude in the mechanics of the performance. The degree of general ability in problem solving in the specific area for which one may have a particular aptitude varies with types of occupations. However, if an individual seems to have a particular aptitude, the extent of this aptitude should be discovered as early as possible and provision made for its development. At the same time attention should be directed toward improving those personality factors, other than the specific ability, that will promote successful performance in the field of the special aptitude. For example, a person may be endowed with superior musical ability; however, successful achievement in this field is dependent upon willingness to spend long hours in practice.

Aptitude and interest. Considerable attention is being given today to the relationship that exists between vocational interest and vocational aptitude. Psychologists and school people are

attempting not only to discover the vocational interests of young people but also to relate these interests to demonstrated aptitudes as training is aimed at the achievement of occupational success.

Many of the supposedly vocational interests of young people are fleeting. They are stimulated not so much by inherent aptitudes as by admiration of persons who have succeeded in these fields, or the wish to satisfy a youthful urge or desire, or similar factors. A boy may want, in turn, to become a candy store owner, a policeman, a fireman, an athlete, a motion picture director, or any other type of worker whose position or activities stimulate his youthful ambitions. For one or another reason a girl may want to be a teacher, a nurse, a motion picture star, or other type of glamorous person. Occasionally these youthful interests are expressions of real aptitudes and persist until they are realized. If that is the case, a young person may strive, often at great personal sacrifice, to achieve success in the chosen field.

Too often, the supposed vocational interests of young people reflect not their own desires but the ambitions of their parents. In his own youth a parent may have been interested in a certain type of vocational activity but was denied entrance into it, and he is determined that his child shall have the "advantages" which he did not enjoy. Parental influence also can be seen in instances where a father who himself has earned success in a particular field insists that his child shall prepare himself for participation in the same field although the child's interest and aptitude should direct him into another.

Young people as well as their parents tend to become interested in one particular occupation, regardless of personal aptitude, because of the financial rewards that are attached to the favored occupation. Another consideration that appears important is the prestige associated with certain forms of work activity. Beckman has arranged occupational fields in order of amount of prestige accorded to workers in the various areas as follows:

I. Unskilled manual occupations
II. Semi-skilled occupations
III. (a) Skilled manual occupations
    (b) Skilled white-collar occupations
IV. (a) Sub-professional occupations
    (b) Business occupations
    (c) Minor supervisory occupations

V. (a) Professional (linguistic) occupations
    (b) Professional (scientific) occupations
    (c) Managerial and executive occupations [7]

An individual's decision to select any form of specific work that can be included in one of these general fields is conditioned by various factors: his interest, his general intelligence, his specific aptitude, the kind and extent of training which is required and in which he is able and willing to engage, and the openings available to him in the field. The professions are probably most selective. Many persons, in spite of their interests, may be denied entrance into professional activity because of lack of general and specific ability, possibilities of training, or opportunities for placement. During periods of economic depression, especially, many find themselves forced by circumstances to engage in occupational activities in which they are not interested and which are below their ability to achieve.

Attempts have been made, through the application of testing techniques, to discover what a person's interests really are rather than what he thinks they are, and to use the information thus assembled as a means of predicting possible areas of vocational participation. Most interest inventories stress broad areas of interest that may be assumed to carry with them some degree of aptitude. A study of these interests may result in discovery of specific aptitude in a particular field. According to Bingham, "Interest . . . is not only a symptom, it is of the very essence of aptitude." [8]

Implications for teachers. As teachers and other members of the school personnel attempt to guide pupils in making vocational choices, an appreciation of the following facts concerning aptitudes is important:

1. Aptitude probably includes both inborn capacity and the effects of environmental conditions.

2. Every individual can be expected to possess more ability in one type of activity than in another.

3. Learning in any area or on any level is conditioned by the learner's readiness to learn.

4. A specific aptitude in the form of talent may show itself early and respond readily to training.

[7] From R. O. Beckman, "A New Scale for Gauging Occupational Rank," *Personnel Journal*, 13:225–233 (1934).   [8] W. Bingham, *op. cit.*, 69.

5. Many characteristics or traits are general for various specific fields of activities.

6. Some so-called aptitudes are forms of special ability that adapt themselves to training toward any one of various occupational fields.

7. Vocational interests may be influenced by factors other than specific aptitude or may represent broad areas that can be directed into any one of several channels.

8. Some progress has been made in the construction and use of measuring techniques aimed at the discovery of aptitudes — general and specific.

BRIEF SURVEY OF MEASURING TECHNIQUES

General statement. Considered broadly, all tests or testing programs — intelligence tests, interest inventories, personality and character tests, educational achievement tests, and occupational proficiency and trade tests — may yield some indication of an individual's degree of special ability in one area rather than in another at the time of the administration of the test. In addition, tests for the purpose of discovering specific aptitudes have been constructed in large numbers and in various areas. The results of these tests have yielded some degree of reliable prediction, especially in areas of simple manual or mechanical activities.

For many vocations, "aptitude" represents a complex of abilities that is very difficult to reduce to objective measurement. In general, our present tests are incomplete and inadequate, although most of them have been scientifically constructed. Psychologists recognize the limitations of these tests and are attempting to construct more objective and more searching measures of abilities and aptitudes. As Jones says, "An adequate aptitude test would be one that would measure all of the factors necessary for success; this is practically impossible. The determination of aptitude for any job would require tests of specific abilities, personality, general mental ability, observations by skilled observers, and mental and physical records." [9] In the following brief survey of testing in various areas only a few of

[9] By permission from *Principles of Guidance*, Third Edition, by A. J. Jones, p. 168. Copyrighted, 1945, by McGraw-Hill Book Company, Inc.

the many testing techniques available are referred to. The purpose of this treatment is to acquaint the reader with testing trends rather than with actual tests or techniques utilized.

Academic aptitude. The American Council on Education's Psychological Examination is intended to measure the fitness of high school graduates for college work. This examination includes tests in mechanics of expression, effectiveness of expression, vocabulary, and speed and accuracy of reading; social sciences; natural sciences and mathematics. Other tests of academic aptitude, such as the Academic Aptitude Test (Verbal and Non-verbal) by Kobal, Wrightstone, and Kunze, aim at testing learning readiness in many areas and include questions concerned with verbal intelligence (information), mental alertness, and comprehension of relations. In general, most of these tests are similar to measures of what may be termed general intelligence, although specific phases of general abilities are emphasized. For example, ability in the language arts can be measured by the administration of the Luria-Orleans Modern Language Prognosis Test, aptitude for science by the Stanford Scientific Aptitude Test, ability in mathematics by the Iowa Algebra Aptitude Test, and other special abilities by prognostic tests of learning readiness, especially on the high school and college levels.

Art and music. Teachers of art seem to be in rather general agreement that there is at present no one test that measures aptitude in artistic performance. The Meier and Seashore Art Judgment Tests appear to be fairly satisfactory in the field for which they are designed.

The best known test of musical aptitude probably is the Seashore Measure of Musical Ability, consisting of six double phonograph records containing exercises in comparisons of pitch, intensity, time, consonance, memory, and rhythm, respectively. The Eastman School of Music of the University of Rochester is successful in the use of these tests combined with the Iowa Comprehension Tests in the determination of the extent to which their entering students may be expected to respond successfully to instruction. There also are paper-and-pencil tests designed to measure degree of information or comprehension in music, such as the Kwalwasser Test of Musical Information and the Kwalwasser-Ruch Test of Musical Comprehension.

Mechanical aptitude. Many tests have been devised to measure manual dexterity and mechanical aptitude. Card sorting, peg-board manipulation, and performance with other types of apparatus are popular. Some tests are of the paper-and-pencil variety in which the subject is expected to recognize relationships or to identify materials used in manual trades.

The first performance tests of mechanical aptitude were the Stenquist Assembly Tests of General Mechanical Ability (1918), which appeared in two forms. Each form consists of ten devices, including a simple lock, a mouse trap, an electric push button, and a bicycle bell. The disassembled parts of each mechanical device are given to the subject, who is supposed to reassemble them within a given time so that the device works. The results of these tests show little correlation with general intelligence but yield substantial measures of prediction of actual performance. Stenquist's paper-and-pencil tests of mechanical aptitudes give results that correlate more highly with general intelligence than with shopwork.

Industry is beginning to make quite extensive use of tests of mechanical aptitude. At the Scoville Manufacturing Company, for example, the Scoville Classification Test (consisting of five nonverbal and three verbal tests) is administered in the employing of tool workers' apprentices. Best results in this field probably are obtained from administering the battery of mechanical aptitude tests (performance and pencil-and-paper tests) constructed at the University of Minnesota.

Clerical aptitude. Since a large number of specific occupations are included in the clerical field, tests of aptitude must be specific to the type of activity for which each test is intended. Hence, tests need to cover such areas as typing, stenography, and operating dictating machines, bookkeeping machines, and comptometers, besides the various other activities that are included under the general heading of secretarial or commercial work.

The Thurstone Clerical Test (1919) includes exercises in underscoring misspelled words, canceling letters, checking errors in addition and subtraction, arithmetic computation, code-learning substitution, and similar activities. One of the recent tests in this field — the Kobal-Wrightstone-Kunze Clerical Aptitude Test (1943) covers three general areas: business practice, number checking, and date, name, and address checking.

William Book and others have carried on extensive studies in the investigation of prediction of success in typing. Book concluded from his study that rate of tapping may be related to aptitude for typing.

Aptitude for professional work. It is generally agreed that entrance into a profession presumes the possession of superior intellectual status and successfully completed intensive and extensive study in the various areas of the chosen profession. The possession of certain personal traits and professional attitudes also is considered important.

Sometimes successful achievement in certain forms of activity appears to be prognostic of aptitude for one or another profession. Attempts have been made to analyze these activities and to devise tests that serve as instruments of prognosis. In law there are tests such as Ferguson and Stoddard's Law Aptitude Examination and the Yale Legal Aptitude Test. Used extensively in the selection of medical students is the Moss Scholastic Aptitude Test for Medical Students.

A battery of tests known as the Pre-Engineering Inventory consists of a comprehensive list of objective tests intended to measure ability for the study of engineering. This battery is used widely by engineering schools as a pre-entrance examination. Teaching aptitude can be measured to some degree by the Coxe-Orleans Prognosis Test of Teaching Ability and by the National Teachers Examinations, the results of which supposedly give indication not only of achievement but also of aptitude.

Interest inventories. Various attempts have been made to construct measuring devices for the discovery of vocational interests. Among the most dependable of these instruments are Strong's Vocational Interest Blanks for Men and for Women. The purpose of these inventories is to discover the extent to which the subject's interests may parallel those of successful members of a given profession. Strong's extensive researches have led him to conclude that persons representative of various occupational groups (mainly professional) show characteristic differences in their interests. Hence an individual planning to enter one of these occupations may be expected to experience success in it if his interests parallel those of leaders in the field, provided he has had proper training.

Looking ahead. With the return of service men and women after World War II, much interest was directed at discovering means of helping veterans to find themselves again in civilian life. Counseling emphasis was placed upon assisting these men and women to find their special abilities and interests.

We may expect a new impetus to be given to work in the whole field of the measurement of aptitudes and vocational interests as the results of veteran counseling are studied. The increased interest among educational and occupational leaders in the field of aptitude discovery is indicative of the recognized need of trying to place the right person in the right job. Much has been done, but a great deal more needs to be done if we are to predict with any degree of certainty the specific area of educational or vocational activity that is best suited to the specific ability and interests of any one learner. What has been done points the way to what can be hoped for.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Differentiate between intelligence and special aptitude.
2. Refute the statement: "Musicians may be expected to have below average intelligence."
3. Name vocational fields in which an aptitude for mathematical computation would be required.
4. Pianists are said to be able to become good typists. Justify this statement.
5. Give examples of any persons whom you know who are successful in vocational fields and who during their childhood gave indications of special aptitude for the work now engaged in.
6. List your youthful ambitions. Give reasons for these supposed vocational interests.
7. Why are you planning to be a teacher? Name your characteristics that would seem to indicate aptitude in this field.
8. What is meant by learning readiness? In what ways has your learning readiness been measured during your school life?
9. Differentiate between *aptitude* and *talent*. What is your interpretation of *genius?*
10. Give examples of families in which certain special abilities have seemed to appear generation after generation. How do you explain instances of this kind?
11. Discuss the truth of this statement: "A highly intelligent person is likely to achieve success in any vocational field."

12. Discuss some of the methods utilized in helping war veterans of your acquaintance to appraise their vocational interests and aptitudes.

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10

PERSONALITY TRAITS AND THEIR EVALUATION

THE first half of the twentieth century has witnessed a phenomenal development of study and experimentation in the field of human behavior, especially as applied to human learning. More than that, the psychological and educational interest in the learner as an *individual* has increased to a remarkable degree.

Early studies were concerned primarily with the functioning of the higher mental processes. Gradually concern began to be evidenced in individual aptitudes or special abilities. With an ever-increasing emphasis upon human relationships and the education of the "whole" individual as a person, the thoughts and energies of psychologists and school people are being directed toward the study of the individual in his relationships with others. Interest also is being shown in the evaluation of an individual's traits so that he can be guided toward self-improvement and the achievement of socially constructive patterns of behavior.

THE NATURE OF PERSONALITY

Concepts. The term *personality* eludes exact interpretation even to a greater degree than the terms intelligence and aptitude. Concepts of personality range from concern with but one or two characteristics to an attempted explanation of personality as a combination of vague intangible qualities. The word personality often is used to describe a person's physical appearance, form of

speech or manner, or the amount of "it," "oomph," or glamour he possesses. To some people, personality is that something with which an individual is born, which is unaffected by environmental influences, and which permeates all his actions. Others regard an individual's personality as the person himself, and they use the two terms, personality and person, interchangeably. Still others conceive of personality as representing forms of behavior responses to particular situations. The response varies with the situation and has no existence outside the situation. Since even psychologists differ concerning the connotation of the term, it is difficult to answer concisely and definitely the question: "What is personality?"

Meaning of the term. The word personality probably had its origin in the Latin verb *personare*, which means *to sound through*. This term was used to describe the voice of an actor speaking through a mask. At first the term *persona* referred directly to the mask worn by actors. Later it came to be applied to the actors themselves. During early Roman times, then, personality was regarded as constituting what a person seemed to be.

Some of the better known attempts at defining personality are presented below as expressions of various psychological interpretations of the term. Among the definitions are those so broad that it is almost impossible to apply them practically; others are narrow in concept and hence appear to disregard all the factors that probably are involved. As the reader reflects on these definitions, he can evaluate each in terms of his own present concept of the word — personality.

"Personality is that which makes one effective, or gives one influence over others. In the language of psychology it is one's *social stimulus value*." [1]

"A man's personality is the total picture of his organized behavior, especially as it can be characterized by his fellow men in a consistent way." [2]

"Our personality is thus the result of what we start with and what we have lived through. It is the 'reaction mass' as a whole." [3]

[1] M. A. May, "The Foundations of Personality," in *Psychology at Work*, p. 82 (P. S. Achilles, editor). Whittlesey House, McGraw-Hill Book Company, 1932.
[2] J. F. Dashiell, *Fundamentals of General Psychology*, p. 579. Houghton Mifflin Company, Boston, 1937.
[3] J. B. Watson, *Psychology from the Standpoint of a Behaviorist*, p. 420. J. B. Lippincott Company, Philadelphia, 1919.

". . . Integrated organization of all the pervasive characteristics of an individual as it manifests itself in focal distinctness to others is the phenomenon of personality." [4]

"Personality is the dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to his environment." [5]

"Personality . . . is synonymous with the idea of the organismic functioning of the total individual, including all his various verbally separated aspects, such as intellect, character, drive, emotionalized attitudes, interests, sociability, and personal appearance, as well as his general social effectiveness." [6]

These definitions reflect different psychological schools of thought. However, there appears to be an agreement, expressed or implied, that personality is dynamic, that it refers to integrated behavior, and that it represents an interaction between inherited potentialities and environmental influences. To anyone interested in estimating personality traits or qualities, Traxler's definition has special significance:

For the purposes of this discussion [appraisal of personality qualities] personality will be defined as the sum total of an individual's behavior in social situations. Behavior includes not only overt acts but inward feeling tone produced by the situation as interpreted by the individual through introspection. [7]

Some confusion has arisen concerning the relative meaning of the terms *temperament, disposition, character,* and *personality.* As used especially by some of the older theorists, temperament refers more particularly to a form of emotional response that is inborn. Disposition has been regarded as an element of personality reflecting ancestral tendencies or past experiences. Although the term character has been used as a synonym for personality, it may be regarded rather as an aspect of the integrated whole or personality. Character is associated with moral or ethical values more definitely than other aspects of personality.

[4] G. W. Hartmann, *Educational Psychology,* p. 381. American Book Company, New York, 1941.
[5] G. W. Allport, *Personality: A Psychological Interpretation,* p. 48. Henry Holt and Company, New York, 1937.
[6] L. P. Thorpe, *Psychological Foundations of Personality,* p. 534. McGraw-Hill Book Company, Inc., New York, 1938.
[7] A. E. Traxler, *Techniques of Guidance,* Revised Edition, p. 102. Harper & Brothers, New York, 1957.

ATTEMPTS AT EXPLAINING PERSONALITY

The four temperaments. Hippocrates (400 B.C.) and later Galen (A.D. 150) attempted to classify personality types according to body humors as follows.

TYPE	CAUSED BY EXCESS OF	CHARACTERISTICS
Sanguine	Blood	Quick, gay, not stable
Choleric	Yellow bile	Easily angered
Melancholic	Black bile	Pessimistic
Phlegmatic	Phlegm	Slow, unexcitable

This theory, of course, is no longer accepted. However, there is a slight similarity between it and the relationship that now is recognized to exist between the functioning of endocrine secretions and emotional reactions.

Physical types. According to Kretschmer,[8] individuals can be classified into four groups in terms of their physical form and structure:

athletic — muscular and responsive to desirable adjustments.
asthenic — tall and thin, critical of others but sensitive to criticisms of themselves.
pyknic — short and stout, easygoing and popular with people.
dysplastic — abnormal build with characteristics growing out of the abnormality.

Despite the fact that trained observation of people's behavior does not substantiate this theory, there still can be found those who assume, for example, that short, stout men are jolly and that tall, thin persons are hard to live with.

Somatypes. A recent classification of individuals by Sheldon[9] on the basis of physical characteristics includes the following body or somatypes:

Endomorphic — body soft and round, and behavior dominated by massive digestive viscera.
Mesomorphic — muscular and bony, hard and heavy physique and thick skin.
Ectomorphic — fragile and sensitive to exposure.

[8] For a more complete description of these types, consult E. Kretschmer, *Physique and Character.* Harcourt, Brace and Company, New York, 1925.
[9] See W. H. Sheldon *et al., The Varieties of Human Physique.* Harper and Brothers, New York, 1940.

Sheldon suggests that educational techniques and modes of discipline should be adjusted to the child's somatic type.

Endocrine types.[10] Attempts have been made to associate the possession of certain personality qualities with degree of balance or imbalance of the ductless glands, as illustrated in the following:

Hyperthyroid — overambitious and domineering.

Hypothyroid — lazy and intellectually dull.

Pituitary type — good-humored, patient, considerate, docile, diffident, tolerant of physical and mental pain.

Adrenal cortex (cortin) — the prematurely developed; in females leading to adiposity and beards.

Parathyroid (calcium metabolism) — the explosive type, showing aggressive conduct.

Gonads, hyper-active — the more aggressive personality.

Gonads, hypo-active — the less aggressive personality, interested in art, literature, and music.

Sociological types. Spranger [11] classified individuals according to their reactions toward society as:

Theoretical — metaphysician and pure scientist.

Economic — typical "business" man.

Esthetic — sensuous gratification, unreliable.

Social — interested in fellow beings and social movements.

Political — desires power over others.

Religious — either mystic and pietistic or missionary type.

Extrovert-introvert type. One of the most challenging of the modern theories is Jung's [12] extrovert-introvert classification. According to Jung, people tend to differ in their relations with others to the extent that they are extrovert (socially adaptable and interested in people) or introvert (socially shy and retiring, and interested in their own feelings and reactions). The following list represents some of the characteristics of the extremely extroverted and the intensely introverted person respectively.

[10] See W. B. Cannon, *Bodily Changes in Pain, Hunger, Fear and Rage*, D. Appleton-Century Company, New York, 1929. L. Berman, *The Glands Regulating Personality*, The Macmillan Company, New York, 1921. A. T. Cameron, *Recent Advances in Endocrinology*, Churchill, London, 1933.

[11] E. Spranger, *Types of Men*. Niemyer, Halle, 1928.

[12] See C. G. Jung, *Psychological Types* (Translated by H. G. Baynes). Harcourt, Brace and Company, New York, 1923.

EXTROVERT CHARACTERISTICS	INTROVERT CHARACTERISTICS
1. Fluent in speech	1. Better at writing than at speaking
2. Free from worries	2. Inclined to worry
3. Not easily embarrassed	3. Easily embarrassed
4. Usually conservative	4. Inclined to be radical
5. Interested in athletics	5. Fond of books and magazines
6. Governed by objective data	6. More influenced by subjective feelings
7. Friendly	7. Rather reserved
8. Likes to work with others	8. Likes to work alone
9. Neglectful of ailments and personal belongings	9. Careful of ailments and personal belongings
10. Flexible and adaptable	10. Lacking in flexibility [13]

Classifications similar to the above have gained wide popularity because they place emphasis on behavior aspects of personality traits which are relatively easy to discern in our daily relations with people. Unfortunately, not all persons give evidence to the same degree of all the behavior reactions associated with any one classification.

Mentally ill persons may show characteristics that tend definitely toward one extreme or the other. The behavior of normal individuals, however, is likely to be conditioned by the situations in which they find themselves or by their past experience. For example, a person may be reticent or shy in one situation and outgoing and confident of himself in another. A person who is fluent in speech may be fond of books and magazines. Since the majority of us appear to vary in the degree and kind of responses supposedly typical of introversion or extroversion, another classification must be added — *ambiversion*. The ambivert gives evidence of behavior that may be extrovert in some situations and introvert in others. For example, a person may be fluent both in oral and in written expression, or may be friendly but like to work alone. Most of us belong to the ambivert group. If Jung's many subdivisions of his general classification are not considered, it must be accepted in modified form as indicative of *tendencies* one way or the other rather than of distinct grouping.

Comments relative to types. The various theories concerning personality types listed above represent respectively philosophical

[13] From W. W. Cruze, *Educational Psychology*, pp. 387–388. Copyright, 1942, by The Ronald Press Company.

interpretations of personality, interpretations based upon physical and physiological characteristics, and interpretations that grow out of social relationships. A general criticism of such classifications is that they tend to place emphasis upon one or another phase of development and to deal with extremes rather than with what Thorndike refers to as the mediocrity of human nature.

From the wealth of material included in the various pseudo-scientific and scientifically determined explanations of personality it may be possible to discover those qualities inherent in human nature that in this or that situation cause the individual to react as he does.

Meaning of trait. At present interest is being directed toward an explanation of traits as unitary or specific. Psychologists usually define a trait as a mode of behavior. For example, "It is any identifiable attribute of the total organism which is manifested in behavior. It does not refer to an unchangeable quality or to a mode of behavior unalterably fixed." [14] Gordon Allport, who supports the biophysical concept of personality organization, believes that traits are "dynamic and flexible dispositions, resulting, at least in part, *from the integration of specific habits*, expressing characteristic modes of adaptation to one's surroundings." [15] In other words, behavior is regulated from within the individual and is relatively independent of external environmental influences. An industrious person can be expected to be consistently industrious, or a sincere person tends to be sincere in all or almost all of his dealings with other people. This point of view may be referred to as the theory of "unitary" or general traits.

Another explanation of trait functioning is one that would place the emphasis for behavior responses upon the demands of the situation rather than upon any integration of traits within the individual. The theory of the "specificity" of trait organization would seem to be upheld in the findings and conclusions of the Character Inquiry,[16] a comprehensive study of children's

[14] H. C. Witherington, *Educational Psychology*, Revised Edition, p. 406. Copyright, 1952, by Ginn and Company.

[15] G. W. Allport, *Personality: A Psychological Interpretation*, pp. 139–140. Copyright, 1937, by Henry Holt and Company.

[16] See H. Hartshorne and M. A. May, *Studies in Deceit*. The Macmillan Company, New York, 1928. See also suggested references at the end of this chapter.

behavior made two decades ago. In situations involving honesty, for example, it appeared that the behavior of children was influenced by the exigencies of the testing situation rather than by the functioning of a unitary trait that impelled the child to be honest. In fact, May concluded from his studies that "traits are only convenient names given to types or qualities of behavior which have elements in common. They are not psychological entities but rather categories for the classification of habits." [17]

Commenting upon May's study and conclusions, Allport, however, claims that in the study the terms "bad" and "good" were applied to the behavior of the children; that the study was confined to the behavior response of about 10,000 still unformed children; that the studies involved traits that clashed, for example, desire for approval as opposed to honesty; and that the results run counter to the kind of behavior that seems to be generally characteristic of persons who are usually cheerful, trustworthy, pessimistic, industrious, and the like.

Patterns of behavior become more fixed as they are influenced by the taboos and sanctions set up by society. It probably can be said, therefore, that as an individual develops toward maturity certain characteristic traits tend to become fixed in terms of the kinds of approval to which he is sensitive. By the time he has reached adult status his behavior reflects inner adjustments to life situations that have grown out of his various experiences — home, school, religious, and social. These adjustments then directly influence the kind of behavior that he may be expected to display in normal life situations. If and when a person seems to depart from an accustomed behavior pattern, the cause of his actions may be found in the effect upon him of toxins, drugs, or disease; of unusual emotional strain; or of an environmental upheaval that completely disturbs his attitude toward life, with a consequent modification of his usual behavior.

DEVELOPMENT OF PERSONALITY

Factors of physical structure and function. The operation of the nervous and circulatory systems makes possible a neural-chemical integration in human organization. The general elements of personality can be grouped as physical structure,

[17] From M. A. May, "Problems of Measuring Character and Personality," *Journal of Social Psychology*, 3:133–145 (1932).

mental capacities, aptitudinal abilities, and emotional status. The physical structure grows and develops. Within the pattern of this growth may lie some of the elements that affect behavior traits. A person may be unusually tall or unusually short, overly stout or very thin, large nosed or small footed, or symmetrically or asymmetrically featured. He may even suffer from a definite physical abnormality. The physical factors themselves may have little or no effect upon a person's behavior characteristics. However, the attitude toward him on the part of his associates as a result of his physical appearance may affect the pattern of the traits that are a part of his personality.

The degree of an individual's mental brightness or dullness also determines the extent to which he is able to acquire conformity to social standards and pattern his behavior thereby. That feeble-mindedness, for example, may find its origin in the germ plasm appears to be an observable fact. The personality traits of the subnormal differ from those of the so-called normal — varied as the latter may be.

The possession of a special aptitude carries with it tendencies to behave in one way rather than another that can be considered to be concomitant to possession of the aptitude. Not all musicians are temperamental or easily aroused emotionally. As one person jestingly phrased it — artistic temperament probably consists of ninety-nine per cent temper and one per cent temperament. However, the sensitiveness that may accompany artistic superiority, the spoiling of the successful artist by an admiring public, and the emotional stresses that accompany the perfecting of an art, all may contribute to the developing of certain behavior traits that are associated with artistic aptitude. On the other hand, many gifted persons display well-balanced and emotionally controlled behavior traits.

The emotional factor of personality has received much attention from psychologists. The development of the emotions was discussed in Chapter 6 and will not be considered here except by way of reference to the physiological bases of emotional behavior which are considered to be found in the functioning of the secretions of the endocrine glands.

The endocrine glands. The endocrine or ductless glands, so-called because they discharge their secretions (hormones) directly into the blood stream, appear to influence the behavior

of individuals according to their balance or imbalance. In Figure 14 is shown the location of some of the glands that affect a person's behavior. Oversecretion or undersecretion of any of these glands may exert a tremendous influence upon an

individual's development and consequently upon his personality.[18]

The effect of the functionings of these glands is summarized by Sorenson as follows:

The endocrine glands seem to function together and for similar purposes. For example, the secretions of the pituitary, pineal, thyroid, and sex glands control growth very definitely. Furthermore, the thyroid, islands of Langerhans, and adrenals influence metabolism and the use of food taken into the body. The endocrines appear to be a complex interdependent system for maintaining the chemical balance of the body. Growth and health are dependent on them; our mental and emotional lives are both cause and effect of their function. If these glands function normally, we are likely to be well and happy; and also if our emotional life is a happy one, the psychic effects on the endocrines will be favorable.[19]
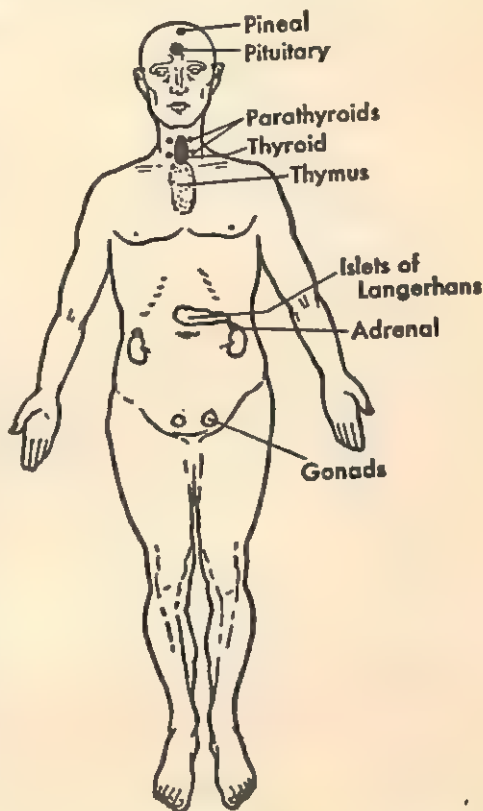
FIGURE 14. *The Location of Glands of Internal Secretion*

From J. F. Williams, *Personal Hygiene Applied*, *Eighth Edition*, p. 361. Copyright, 1946, by W. B. Saunders Company.

Environmental influences. A person's more or less consistent pattern of behavior as he interacts with others, generally referred to as his personality or personality traits, has its origin in his

[18] See R. G. Hoskins, *The Tides of Life*. W. W. Norton and Company, New York, 1933.
[19] By permission from *Psychology in Education*, by H. Sorenson, p. 58. Copyrighted, 1940, by McGraw-Hill Book Company, Inc.

inherited potentialities. However, his specific behavior responses in this or that situation result from the development of his potentialities as these are stimulated by the conditions of the environment in which he develops and the experiences which grow out of human interrelations.

That social or environmental factors affect the personality even of young infants is evidenced in the results of studies of their behavior. Investigations of the changing of or of the persistence of reactions, such as crying, negativism, jealousy, irritability, and quietness,[20] seem to indicate that environmental as well as biological factors are responsible for a very young child's personality tendencies. The interaction between nature and nurture continues as the child experiences home and school living.

Home influences. The attitude of parents toward the child, toward one another, and toward other people, events, and objects exercises a potent influence upon the child's developing personality.[21] Nor does this influence cease with childhood. Stott's study of adolescents in rural areas of Nebraska indicates the effect of home life upon high school pupils.[22] Factors such as enjoyment of group family life, little if any work done away from home by the mother, amount of punishment, welcoming of the young people's friends to the home, emotional control and good health of the parents, and a sharing with the parents of joys and sorrows seem to lead to good adjustment on the part of adolescents.[23]

Socioeconomic inferiority often is advanced as a cause of the development of undesirable personality traits among young people. The relationship between low economic status and maladjusted personality does not hold for all individuals. A child may be affected adversely by his underprivileged state, especially if he is mentally below normal. However, more intelligent individuals have shown themselves able to rise above

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[20] See E. Learner and L. B. Murphy, *Methods for the Study of Personality in Young Children*, Monographs of the Society for Research in Child Development, 6: no. 4: 3–8 (1941). N. M. Reynolds, *Negativism of Preschool Children*, Contributions to Education, No. 299, Bureau of Publications, Teachers College, Columbia University, 1928.

[21] See P. M. Symonds, *The Psychology of Parent-Child Relationships*. D. Appleton-Century Company, New York, 1939.

[22] L. H. Stott, *The Relation of Certain Factors in Farm Family Life to Personality Development in Adolescence*. Agricultural Experimentation Station Research Bulletin, No. 106, pp. 40–41. University of Nebraska, 1938.

[23] For a detailed account of adolescent adjustment see L. D. Crow and A. Crow, *Adolescent Development and Adjustment*. McGraw-Hill Book Company, New York, 1956. Also P. Landis, *Adolescence and Youth*, Second Edition. McGraw-Hill Book Company, New York, 1952.

poor childhood conditions. Parental attitude often is a determining factor. These facts are borne out by Coleman's study of 2,800 junior high school pupils.[24]

School experiences. The influence of school experiences upon a young person's developing personality is greater than some teachers realize. Suitability of curricular offerings, teacher attitudes, playground activities, and the home background of training that the child brings with him to the school — all are important factors of influence.[25]

What is a "good" personality? This is a question often asked but difficult to answer. First, the interpretation of the words *good, desirable,* and *well-adjusted* needs consideration. Goodness may seem to have an ethical or moral significance that would remove it from the vocabulary of the psychologist interested primarily in attempting to explain human behavior rather than to pass judgment upon it. The terms desirable and well-adjusted have a social connotation, depending upon the standards set by society concerning what may be considered desirable or when a person is well adjusted.

Second, if personality is regarded not as an isolated entity but as an integration of traits or qualities, it cannot be evaluated except in so far as observed behavior may seem to give evidence of the consistency of this or that trait. One such study dealt with the qualities possessed by children and adolescents who appear to be successful in their relationships with other people. As reported by high school students, the qualities are:

Attractive appearance and manner
Cheerfulness
Co-operation
Generosity
Modesty

Sincerity
Kindliness
Sympathy
Loyalty
Trustworthiness

The homely virtues (punctuality, care of property, neatness, acceptable use of English, and the like) [26]

[24] H. A. Coleman, *The Relationship of Socio-Economic Status to the Performance of Junior High School Students.* Contributions to Education, No. 264. Peabody College for Teachers, 1940.

[25] See L. D. Crow and A. Crow, *Mental Hygiene,* Second Edition, Chapters 6–9. McGraw-Hill Book Company, New York, 1951. Also L. D. Crow and A. Crow, *Introduction to Education,* Chapters IX, XI–XII, XXI–XXIII. American Book Company, New York, 1954.

[26] Alice Crow and L. D. Crow, *Learning to Live with Others,* Chapter II. Copyright, 1944, by D. C. Heath and Company.

Other studies dealing with personality traits include a comparison between certain personality traits and social success of elementary school children;[27] a study of ascendance as related to success;[28] and Link's investigation concerning the relation of extroversion to the adjustment of personality.[29]

In conclusion it may be stated that an individual's personality is rooted in his physical and mental potentialities. As the biological factors interact with social or environmental influences, the pattern of his personality is developed. During his maturing years and after, his behavior is conditioned by the strength of certain of his traits. People differ from one another to the extent that they respond in their attitudes and behavior to such personality-developing factors as their emotional drives, their interests, their urges toward self-expression, and their appreciation of values. Whatever education can do to guide the young person toward desirable self-discipline and self-expression will help him so to integrate his attitudes, his ideals, and his overt behavior that there will emerge a consistent and wholesome personality pattern.

EVALUATION OF PERSONALITY TRAITS

Estimating versus measurement. When we attempt to discover the degree to which an individual may seem to possess this or that personality trait, we are faced with difficulties of measurement. A trait is not a fixed entity. It is not static; it is not a quantity. Hence, a trait cannot be measured as objectively as height, weight, or rate of heart beat. Jones claims that "measurement" as the term commonly is used cannot be applied to methods of evaluating personality because "(1) There is nothing approximating a zero point for reference. (2) There is no equality of units. (3) There is no agreement on the basic terms used. (4) There are no satisfactory measuring instruments."[30]

The most that we can hope to accomplish as we attempt to apply a "measuring" rod to the personality traits of an individ-

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[27] M. E. Bonney, "Personality Traits of Socially Successful and Socially Unsuccessful Children," *Journal of Educational Psychology*, 34: 449–472 (1943).

[28] L. M. Jack, "An Experimental Study of Ascendent Behavior in Pre-School Children," *University of Iowa Studies in Child Welfare*, 9: no. 3 (1934).

[29] H. C. Link, "A Test of Four Personality Traits of Adolescents," *Journal of Applied Psychology*, 20: 527–534 (1936).

[30] A. J. Jones, *Principles of Guidance*. Third Edition, p. 179. Copyright, 1945, by McGraw-Hill Book Company, Inc.

ual of any age is to appraise his behavior in terms of estimating instruments that may yield some information concerning his thoughts, attitudes, or behavior *at the time* of the appraisal. Although such instruments of appraisal may be called tests, scales, inventories, or measures, they do not measure *capacity* but rather are means of discovering the *extent* to which an individual has succeeded in adjusting to his own needs and interests and to social demands. Norms or standards with which the individual's performance on a "test" is compared are themselves subjective in that they represent either the average of performance of a large group (which itself may not represent a high degree of adjustment) or the varying standards of the appraisers at the time of the appraisal.

Other obstacles lie in the way of accurate appraisal of personality traits. In paper-and-pencil techniques of evaluation the subject may know what the desired response should be and give it, but his response may not be an indication of his actual behavior practice. For example, a question that appears in the Thurstone Personality Schedule is "Are your feelings easily hurt?" This is a good question if the subject answers it truthfully, or if he can answer it truthfully. Who wants to admit that he is a "sensitive soul"? Moreover, many persons who are sensitive to criticism do not recognize the fact that they possess this trait. Rather, they are inclined to believe that unfavorable comments made to them or about them by others are unjust and not based on fact.

Another difficulty is the so-called "halo" effect that may operate when one person is attempting to rate another. As *A* goes about to rate *B*'s observable possession of various traits, *A* may be so impressed by the apparent presence of one specific trait that he overestimates or underestimates other traits possessed by *B* in relation to the one that causes the halo effect.[31]

A third significant difficulty is one that has been mentioned earlier. An appraisal of a personal trait is valuable as indicating expected behavior only at the time of the appraisal or shortly thereafter. Although it may be assumed that a trait possesses some consistency as a director of behavior, factors external to an individual may so influence the overt expression

[31] See E. G. Fleming, "Halo and Personality," *Teachers College Record*, 43: 564–569 (April, 1942).

of the supposed trait in a particular situation that prediction can go no further than the *likelihood* that the person will respond in the predicted way in a future given situation. In spite of their weaknesses, however, estimates, evaluations, and appraisals of human traits have value that will increase as techniques are refined and as more is known concerning the nature of human traits themselves.

Nonscientific and pseudoscientific methods. Astrology dates back to Egypt of 300 B.C. During the early days of civilization whole nations believed that behavior and experience were linked closely with the position of the sun, the moon, and the planets at the time of one's birth. Also from ancient times has come the application of numerology as a means of guiding one's attitudes and activities. The number 13 still appears to have ominous significance to some moderns.

Graphology long has been accepted by some as a means of estimating personal traits, as characteristic handwriting has been linked with the possession of certain personality qualities to this or that degree. Palmistry, crystal gazing, fortune telling (or character reading) by means of cards, tea leaves, or coffee grounds have not yet lost their appeal for some people.

Such pseudoscientific attempts at personality appraisal as phrenology, physiognomy measurement, and Lombroso's criminal types are based upon the physical characteristics of the individual. Thus far there has been no factual evidence of any real relationships between the bumps on one's head or certain anthropometric measurements and personality traits. However, there still are some people who are enthusiastic defenders of the value of these techniques.

APPRAISAL TECHNIQUES

Kinds of techniques. Various methods have been devised for appraising personality or personality traits. Those in most general use can be classified roughly as (1) trained observation under controlled conditions; (2) appraisal of personal qualities or characteristic behavior of one person by another through the use of rating scales or anecdotal accounts of behavior witnessed; (3) self-appraisal by means of the questionnaire technique; (4) rating by means of tests of performance; (5) projective methods. A discussion of any one of these procedures is not

possible here; hence this section will be limited to a few illustrative comments. The reader is referred for further study in this area to the "Selected References" at the end of this chapter.

Controlled observation. The utilization of this technique should be limited to the psychological laboratory. The study should be conducted by trained observers who are able to isolate the particular form of behavior to be appraised from other incidental behavior responses. Even under the most favorable conditions "sampling" of behavior gives evidence of weakness.

The length of the period of observation and the number of such periods, the extent to which the observer has a clear idea of the particular trait that he is observing, the number of extraneous factors present in the situation, and the fact that the observation is limited to the functioning of the trait in a specific situation — all these factors may affect the reliability of the conclusions that are drawn from the results of the observations.

Gesell's observational studies of the behavior of very young children referred to earlier in this book were scientifically planned and administered. Olsen's investigation into the factors that may be connected with nervous habits or tics is another example of carefully controlled observation.[32]

Rating by others. By rating is meant the comparison of one individual with other members of the group, resulting in a subjectively arrived at judgment of the strength or weakness of a trait or list of traits supposedly possessed by the individual. The rater should know all members of the group well if he is to make comparative judgments that shall approximate some semblance of accuracy.

In its simplest form, the rating scale consists of *Yes* or *No* answers to questions such as "Do you believe him to be honest?" "Is he liked by his fellow pupils?" Some of the rating blanks used by business firms for the purpose of obtaining from persons who know him well a personality evaluation of a candidate for a position in their firm still follow this simple form. However, most rating scales used by schools, colleges, and other institutions are so constructed that the rater may give his evaluation of an individual in terms of a scale that indicates varying degrees of possession of a particular trait. Usually these degrees are indi-

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[32] W. C. Olson, *Measurement of Habits in Normal Children*. University of Minnesota Press, 1929.

cated by numbers from 5 to 1, 7 to 1, or 10 to 1, and descriptive phrases are attached to each numerical value. An example of the form of scale that is in general use appears below:

EXCELLENT	ABOVE AVERAGE	AVERAGE	BELOW AVERAGE	POOR	Put your rating in this square
5	4	3	2	1	

PERSONAL ATTRACTIVENESS

Exceedingly attractive	Well-groomed, pleasing appearance	Satisfactory appearance	Careless about appearance	Unkempt, not tidy, offensive	☐

SOCIAL ADAPTABILITY

Completely at ease in groups	Usually at ease	Able to adjust to the group if interested	Awkward, ill at ease	Unable to adjust to social situations	☐

In order to avoid the "halo" effect that might influence a rating if it were done by one person only, the ratings of several evaluators are averaged. In some instances, the raters are encouraged to add anecdotal accounts in order to explain or to substantiate the rating given.

The Personality Report [33] used by the National League of Nursing Education exemplifies the type of rating scale that is becoming increasingly popular. The report is divided into five major areas:

A. How are others affected by her appearance, voice, and manner?
B. Does she need constant prodding or does she go ahead with her work without being told?
C. Can she lead and get others to do what she wishes?
D. What kind of emotional behavior does she show?
E. How does she adjust to changing situations?

The form of the Personality Report is illustrated below:

A. How are others affected by her appearance, voice, and manner	Seek her Like her Indifferent to her Tolerate her Avoid her No opportunity to observe	Please record here instances that support your judgment

The value of an appraisal of an individual's traits by competent judges depends upon the clearness and definiteness of statement of the items listed (too often the items are vague or too all-

[33] National League of Nursing Education, New York, N. Y.

inclusive) and the care and accuracy with which the judgments are made. Teachers especially are asked to appraise the personality traits of so many students that except in special cases the appraisal becomes almost a routine job. Consequently, most of the ratings are "average." For this reason, there is a growing trend toward requiring teachers or supervisors who deal with large groups of individuals to make official appraisals only for those individuals who, in their judgment, fall either in the superior or in the much below average classification. All the others then are supposed to approximate the average or the center of the distribution. The superior ratings can be used as a basis for special recognition in school or for advancement on the job. The individual who falls very much below average should receive special guidance aimed at the improvement of attitudes or behavior.

Self-appraisal. Many forms of questionnaires, inventories, tests, and other techniques have been devised as means of obtaining from the individual an appraisal of himself by himself in various trait areas. These personality "tests" vary in scope and in form. One of the earliest, the Woodworth Psychoneurotic Inventory, includes 116 questions covering many phases of an individual's reactions to himself, to other people, and to his experiences. The form of questions is illustrated below:

Has your family always treated you right? Yes No
Are you bothered much by blushing? Yes No

The subject is expected to mark the answer which is more nearly correct. However, the subject may find it difficult to answer simply by Yes or No. This difficulty is obviated somewhat by the method used in the Bernreuter Personality Inventory,[34] in which the subject is given three choices:

Yes No ? Do you often feel just miserable?
Yes No ? Do you usually prefer to work with others?

In the Pressey X–O Test, the purpose of the questions is disguised from the subject. The test is made up of twenty-five

[34] This is a scientifically constructed instrument of appraisal. The inventory consists of 125 questions and takes about 30 minutes to answer. By the use of six different scoring sheets appraisals can be made of: neurotic tendency, self-sufficiency, introversion-extroversion, dominance-submission, confidence, and sociability.

questions, each question consisting of five words or phrases. The subject is to cross out certain words. For example,

Test 1 — Cross out everything you think is wrong.
    1. begging, smoking, flirting, spitting, giggling

Test 2 — Cross out everything you have ever worried about or felt nervous or anxious about.
    1. loneliness, work, forgetfulness, school, blues

Test 3 — Cross out everything you like or are interested in.
    1. fortunetelling, boating, beaches, mountains, vaudeville

The subject's reactions to these words lead to certain conclusions concerning his characteristics or traits.

Another form of test is illustrated in the Allport and Allport A–S Reaction Study, which attempts to measure the degree of an individual's ascendance or submission. The questions in this test are arranged in a form similar to the following:

Have you ever crossed the street to avoid meeting someone?
    frequently
    occasionally
    never

The Downey Will-Temperament Test is a kind of performance test in which the individual is supposed to give indication of his customary modes of behavior by the way he responds (by writing on the answer form) to directions given him. For example, on a line of a given length he is expected to write *United States of America*. Such facts as the number of letters that extend beyond the line, or the letters or words omitted, are considered to be indicative of a specific personality characteristic. The test is novel and intriguing. It is difficult to score, however. Also, in spite of the author's claims to the contrary, there can be doubt that an individual's characteristics as these are displayed in a writing situation can be considered to be predictive of his behavior in all situations.

The projective method. This method is believed to give a picture of an individual's unconscious or fantasy life. Among the older forms of the method were included hypnosis, free association (responding with the first word that comes to consciousness to a stimulus word, such as *table, love, dirty*, etc., time taken

to respond as well as the response word being significant), automatic writing, and dream analysis.

One of the newer projective methods is the Rorschach method that takes the form of an ink-blot test of association. The subject is shown a series of ten ink-blots and is asked to interpret the meaning (to him) of each blot. The author believes that in the interpretation of the blots is presented a "total action" picture of the subject's personality. This method can be used with children and was administered to service men and women during World War II.[35]

Other projective methods include thematic apperception tests (picture interpretation); [36] free painting (much used with preschool children); [37] voice analysis (blind analysis in which persons unacquainted with the subject make judgments concerning his personality from records of his voice); [38] and what usually is referred to as *play therapy*, in which the child's behavior with toys, dolls, etc., is supposed to be an indication of unconscious animosities, desires, or conflicts.[39]

Comment on appraisal techniques. The field of personality study and evaluation is rich in possibilities. Some excellent investigations have been conducted. Usable techniques of appraisal have been constructed that sometimes surprise us by the extent to which the results of their administration appear to agree with one another and with other ways of estimating personal traits — such as living with a person, for example, and watching him in action day-by-day. However, present techniques of evaluation should be used cautiously. Any temptation to make broad, sweeping generalizations concerning any one individual or group of individuals from the data secured

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[35] For a more detailed description of the Rorschach method see B. K. Klopfer and D. M. Kelley, *The Rorschach Technique*, World Book Company, Yonkers, N. Y., 1942. Also M. Ford, *The Application of the Rorschach Test to Young Children*, University of Minnesota Press, 1946.

[36] H. A. Murray, *Explorations in Personality*, pp. 123–124, 182. Oxford University Press, New York, 1938.

[37] R. H. Alschuler and L. A. Hattwick, "Easel Painting as an Index of Personality in Preschool Children," *American Journal of Orthopsychiatry*, 13:616–626 (1943). R. H. Alschuler and L. A. Hattwick, *Painting and Personality: A Study of Young Children*, Two Volumes. University of Chicago Press, 1947.

[38] P. J. Moses, "The Study of Personality, from Records of the Voice," *Journal of Consulting Psychology*, 6:257–261 (1942).

[39] C. E. Moustakas, *Children in Play Therapy*, McGraw-Hill Book Company, 1953.

from the administration of one or even more than one of these techniques should be avoided assiduously until scientific procedures can be further refined.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Differentiate among temperament, disposition, character, and personality.
2. In what ways is an individual's personal appearance related to his personality?
3. Make a list of "popular" words used to describe personality.
4. What is your attitude toward graphology, palmistry, astrology, or phrenology?
5. Make a list of ten personality traits. Next to each state briefly the behavior forms in which the trait may be evidenced.
6. Study the behavior of persons who seem to correspond to each of Kretschmer's types. To what extent do these persons seem to be "true to type" in their behavior?
7. In what ways do the endocrine glands affect personality?
8. What advantages have the bright over the dull in personality improvement?
9. From your own experience give instances of the effect of each of the following upon a child's personality development: (*a*) home, (*b*) school, (*c*) religion.
10. If you have taken a personality test, report your reaction to it.
11. Discuss student rating by teachers; teacher rating by students.
12. What evidence can you find to support the assumption that a six-month-old baby exhibits signs of possessing personality traits?
13. Compare the unitary and the specific trait theories.
14. Differentiate between biophysical and biosocial explanations of personality. With which do you agree? Why?
15. What traits would you add to the list on page 195 of the traits suggested by high school students?
16. What is your interpretation of a "good" personality?
17. Discuss "integration of personality."
18. Read, and discuss in class, a study or report on one of the projective methods of evaluating personality.

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11

EDUCATIONAL IMPLICATIONS OF
INDIVIDUAL DIFFERENCES

As we consider the various aspects of individual development in any area, two facts stand out: (1) All of us share elements of likeness in our developmental patterns, and (2) within the general framework of what constitutes human heritage — biological and social — every individual tends to be different. The differences on the whole tend to be quantitative rather than qualitative. The extent to which individuals vary constitutes their distinguishing qualities or combination of qualities.

INDIVIDUAL DIFFERENCES AMONG LEARNERS

Areas of difference. Before the first attempts to measure mental capacity, the one general factor of difference that influenced school grading was chronological age. A child entered school at about six years of age, and he was supposed to progress regularly in his schooling in terms of the age factor. It was assumed, moreover, that all children should be able to profit similarly from instruction that was the same or nearly the same in content and method of presentation for all learners on the respective grade levels. Apparent inability on the part of a learner to master study material was explained in terms of factors, such as laziness or stubbornness, that failed to take into consideration the one fact that learners differ in their ability to perform in any one or more areas of learning material and at any one stage of development.

We have come to realize that differences from others as well as likenesses to them are characteristic of all learners at any stage of learning. The causes and effects of these individual differences and the extent to which educational objectives, content, and techniques should be adjusted in terms of such differences are receiving increasing attention from psychologists and school people.

Chronological age, as it represents the learner's level of maturity and hence his possible educability, is and should be a factor of difference. No matter how superior mentally or physically a child of three may be, he cannot be expected, because of difference in degree of maturation, to engage in learning activities that are suitable for the fourteen-year-old. General mental ability, as measured by reliable tests of intelligence, also gives an index of a child's readiness to learn. The possession of special abilities varies from individual to individual and needs to be taken into account, especially on the upper levels of learning. Further, readiness to engage in a particular learning situation may differ from individual to individual on any age level.

The physical constitution of the individual learner, the extent to which he may be atypical physically, his degree of emotional stability, his temperament, his attitude toward learning, and his interests — whatever the cause — affect the extent to which learning success may be achieved. Other factors, such as sex, racial or national origin, home influences, economic status, previous learning experiences, adequacy of learning materials, and teaching techniques, all may influence to a greater or lesser degree an individual's ability to achieve successfully on any learning level.

Some of these actual or possible differences among learners have been considered directly or by implication in previous chapters. At this point will be presented briefly those aspects of difference among learners for which educational provision should be made. In the consideration of individual differences it must be kept in mind that difference in any quality or characteristic is graded. There can be no classification into *all* or *none*. A child is not intelligent or unintelligent, interested or uninterested, completely controlled emotionally or completely disturbed, one hundred per cent ready to engage in a certain form of learning or at a zero level of readiness. Even factors external

to the individual, such as home influences, previous educational opportunities, curricular offerings, and teaching, are neither wholly good nor completely bad. No matter what the aspect of behavior or the factor of influence, individual learners portray *degrees* of difference rather than absolute difference from one another. In addition, the individual differs within himself in the various aspects of his total personality. However, since no trait exists in isolation, the effect of the functioning of any one trait tends to carry over to other traits and to influence the total behavior pattern of the individual. The child who has learned the value of industriousness is likely to practice it in his school as well as home activities.

Moreover, many individuals tend to vary but slightly one from another with respect to any trait or condition, and thus cluster around a mean of distribution. The deviates then taper off toward either extreme. This fact increases the difficulty of providing educationally for all the varying degrees of differences that may exist among learners in many aspects of personality.

Mental ability and learning achievement. *General intelligence.* Those children who, according to the Binet classification, fall within the definitely subnormal group — idiots and imbeciles (I.Q.'s below 50) — usually do not constitute a problem for the regular school except in the lower grades before provision for their care can be arranged for in special schools or institutions. A few may find their way into the upper grades, but these are exceptions.

Hence, systematic education is concerned with individuals whose mental ability ranges from about 50 I.Q. upward. Morons (I.Q.'s ranging from 50 to 70) can be expected to make little learning progress except in the very simplest of learning situations. Those children whose I.Q.'s range from 70 to 80 also experience difficulty, even on the lower school levels. There is general agreement that learning ability in regular school situations is relatively impossible for a child whose I.Q. is below 75. The borderline and the dull (75 to 90 I.Q.) may be able to master some of the simpler learning materials, but they too have difficulty in keeping pace with brighter children as learning content becomes increasingly more abstract.

Many children whose I.Q.'s center around 90 possess qualities, such as persistence and desire to learn, that enable them

to show commendable progress if the learning situation is fitted to their level of ability. However, there is a limit beyond which they cannot achieve. This fact often causes emotional disturbance both in the child and in his parents. Because of desirable personality qualities the child may have seemed to make adequate adjustment on the elementary level. The parents have great hopes for his future and insist that he elect an academic course in high school, perhaps against the advice of school counselors. The child is unable to meet the challenge of the more abstract learning situations which he now faces. Failure, discouragement, and bitter criticism of the high school may result, with possible dropping out as soon as compulsory attendance regulations permit, unless the slow learner can be persuaded to transfer to a less academic course.

Learners whose intelligence quotients range from 95 to 105 comprise from forty to sixty per cent of the pupils on the elementary level and also on the high school level, except in specialized schools. In general, teaching is geared to the abilities of these learners and, except in the more abstract learning materials on the high school level, they may be expected to achieve adequately. However, prediction of noteworthy success on the high school level usually must be limited to only those students who have an I.Q. of 105 or above.

Acceptable achievement on the college level would seem to require that the student possess an I.Q. of 115 or better. Some colleges will not admit students unless they have an I.Q. of at least 120 combined with evidence of successful achievement on the high school level. At present, however, data are insufficient to yield any definite conclusions concerning the relationship that exists between mental ability as judged by the administration of intelligence tests and learning success on the college level — or any other level.

Several facts, however, have been established: (1) No matter how favorable the environmental background and learning conditions, the slow learner will reach his limit of educability sooner than will the normal or superior. (2) Under favorable conditions the normal learner may be expected to achieve good success in fundamental learning and in certain forms of specialized learning. (3) If conditions are favorable, the mentally superior may advance successfully in his learning activities as

far as his interests and available educational opportunities will take him. (4) Unfavorable conditions, including the attitude of the learner toward learning situations, can interfere with achievable success on the part of any learner — the bright as well as the dull, the effect being more marked the slower the learner.

The results of adequate intelligence tests carefully administered are helpful in discovering in a general way a child's learning readiness for one or another level of learning and in diagnosing displayed failure to achieve. They also are useful as a means of aiding instruction through ability grouping, as a means of determining the extent to which a particular child's anti-social behavior is related to his degree of mental ability, and for educational and vocational guidance purposes.[1]

Special abilities. Since learning on the elementary level is concerned with the mastery of learning tools, the discovery of the extent to which a child may possess a special ability or aptitude is not so important during the early years of his schooling as it will be later. On the junior and senior high school and college levels provision needs to be made for the development of whatever aptitudes the individual learners may possess. Although general intelligence is a factor in most if not all areas of performance, the results of intelligence tests now used (especially paper-and-pencil and group tests) seem to bear a greater relationship to achievement in academic subject matter than to mastery in some other areas of learning, such as motor skills, penmanship, music, art, and physical education. Consequently, when the education of young people beyond the elementary school level is planned, their special aptitudes and interests should be determined as accurately as possible and should be taken into consideration in the preparation of their programs of studies.

Readiness for learning. Children of the same age are not necessarily at the same stage of readiness to learn. Differences are caused not only by variation in rate of maturing but also by differences in previous learning background.

Six-year-olds who enter the first grade may differ by one, two, or even three years in degree of readiness to profit from formal education. For example, it has been found that the

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[1] See J. M. Stephens, *Educational Psychology*, Revised Edition, Chapter 5. Henry Holt and Company, New York, 1956.

mental ages of the members of an entering first-grade class may range between that of a three-year-old child and that of an eight-year-old. This means that, although the chronological ages of the children may center around six years, their stage of mental maturity (mental age) varies by five years. Also, pre-school home experiences as well as rate of maturation may be such as to encourage the development of some children more than that of others.

Perhaps in no other field of learning is readiness to learn more important than it is in reading. The ability to get adequate thought from the printed page is essential to success on all school levels as well as to proficiency in the higher forms of specialized learning. One of the most significant aims of fundamental education is to prepare the child to master the tools of reading during his elementary school training so that he may be prepared to extend his knowledge in the various areas of higher learning as the result of his acquired ability to understand and apply the content of written material.

Degree of intelligence shows itself in the extent to which a child can profit from reading instruction. However, equally important is the fact that children differ in the age at which they are ready for such instruction. The implications of the above statements will be treated in greater detail in Chapter 21.

Other factors of difference among learners. *Differences in motor ability.* Persons of any age differ in their ability to perform in activities that are pre-eminently motor. Intelligence is a factor in the higher forms of motor skills.[2] In general, motor coordination and ability to perform successfully in the more complex motor skills increase with age as maturity brings with it the power of sustained attention, muscular coordination, speed of performance, steadiness of control, and resistance to fatigue.[3]

The fact that individuals of any group differ widely in their ability to succeed in motor activities can be illustrated by an experiment in mirror drawing. The relative performances of 133 subjects in this experiment are presented in Table VIII.

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[2] See B. Johnson, "Practice Effects in a Target Test: A Comparative Study of Groups Varying in Intelligence," *Psychological Review*, 26:300–316 (1919).

[3] See M. C. Langhorne, "Age and Sex Differences in the Acquisition of One Type of Skilled Movement," *Journal of Experimental Education*, 2:101–108 (1933).

TABLE VIII. *Individual Differences in Speed and Accuracy of 133 Subjects in a Mirror Drawing Experiment. (Adapted from Kingsley)*

	FIRST TRIAL	FIFTEENTH TRIAL
Range in time Mean of time	39 to 538 seconds 178 seconds	15 to 151 seconds 52 seconds
Range in errors Mean of errors	5 to 155 errors 54 errors	0 to 92 errors 22 errors

Some subjects' performance on the first trial was speedier than the average performance in time on the fifteenth. Similarly, more errors were made by some subjects on the fifteenth trial than were made on the average for the first trial. The subjects differed also in gains from the first to the fifteenth trial — from less than ten per cent to more than eighty per cent.[4]

Sex, national, and racial differences. Differences in ability between the sexes and among national and racial groups have not yet been studied sufficiently for the formulation of a general conclusion that will cover all cases. Factors other than *individual ability to master learning materials* may very easily affect the results of studies and measurements.

In most fields of learning, the performance of boys and girls shows little difference except as individual interest or opportunity to learn may affect the success of the learning. The same can be said concerning national and racial differences. Marked superiority or inferiority of achievement, whenever it is found, constitutes a "difference" from the point of view of education. In any group or groups consisting of members of both sexes or of various national or race backgrounds, variation within groups as well as differences among groups is evidenced. Further investigation concerning the causes of such differences needs to be done, however, before any valid generalizations can be made.

Differences in background. Within any group of learners on whatever level, differences in experiential backgrounds can be found that facilitate or retard achievement regardless of individual potentiality to master material. The learning experiences in which the child engages or has engaged in his home affect

[4] Adapted from H. L. Kingsley, *The Nature and Conditions of Learning*, pp. 250–251. Copyright, 1946, by Prentice-Hall, Inc.

his willingness to participate in a present learning situation. Individual interests, attitude toward school and toward particular school subjects (sometimes developed as a result of attitudes in the home or the neighborhood environment), habits of cooperation or non-cooperation, ability or willingness to concentrate on learning material, and acquired study habits — all constitute factors of difference among learners.

The amount and kind of previous experience and knowledge that the individual brings to a specific learning situation have much to do with his capacity for further study or his attitude toward it. If the learner feels (rightly or wrongly) that he already knows much of the study content of a specific course he may lose interest in it and fail to gain from further instruction. The experiencing of a "survey" course in a general learning area, such as general science, may cause a student who later elects biology to be disappointed when he begins the biology course. To the extent that some of the material of the general science course is repeated in this second course the learner may come to feel that he does not need to study. Hence are developed poor study habits which may result in his failure to master the new material of the course.

In a study that attempted to discover the value of extra classroom study in the learning of educational psychology, a preliminary test (pre-test) consisting of 300 short-form questions was administered to the 155 students who participated in the experiment. The questions included the material that was to constitute the subject matter of the course for the first half of the semester. At the end of this unit of learning a final test similar to the pre-test and equated for difficulty was administered to the 155 subjects of the experiment. A comparison of the test results (Table IX) shows that no one was completely unacquainted with the subject matter before the actual learning

TABLE IX. *Preliminary and Final Test Results Reported in an Experiment in Educational Psychology (Crow)*

	PRELIMINARY TEST SCORES	FINAL TEST SCORES
Range of correct answers	14 to 130	99 to 259
Mean	73.3	192.6

started, in spite of the fact that fifty-one of the subjects had not previously taken a course in general psychology. All students gained in knowledge during this learning period.[5]

At the beginning of a new term or on entrance into a school on a level higher than the one just "completed," wide differences may be found among learners in the amount that they have mastered under supposedly similar learning situations. For example, a group of 900 elementary school graduates gave evidence of a wide range of performance as measured by the Test for High School Entrants.[6] The test consists of four parts: I. English; II. Reading Comprehension; III. Arithmetic Reasoning and Computation; IV. General Information. Table X gives the range and median of performance for each subtest. All of these young people had "earned" their elementary school diploma and now were ready to continue their education on the high school level. Unfortunately, some of those who gave evidence of below average performance on the test were candidates for the college preparatory course.

TABLE X.   *Range and Median of Performance of 900 Elementary School Graduates on the Test for High School Entrants (Crow and Crow)*

PART	NUMBER OF QUESTIONS	RANGE OF SCORES	MEDIAN SCORE
Part I	50	6 to 47	26
Part II	40	3 to 40	28
Part III	24	1 to 23	11
Part IV	50	7 to 47	30
Total.	164	32 to 145	95

The authors are making a comparison of the intelligence quotients as obtained from the Henmon-Nelson Test of Mental Ability High School Examination for grades 7–12 and the reading comprehension grades as obtained by the Nelson Silent Reading Test for 300 of these learners. A preliminary study of the data would seem to indicate that there is high correlation

[5] L. D. Crow," The Comparative Value of Extra-Classroom Study in the Learning of Educational Psychology," Doctoral Dissertation, School of Education, New York University, 1927. See also *Journal of Educational Research*, October, 1930, for condensed report of the study.

[6] L. D. Crow and Alice Crow, "Test for High School Entrants." Acorn Publishing Company, Rockville Centre, N. Y., 1945.

between performance on the Test for High School Entrants as compared with the I.Q.'s and reading grades. It is interesting to note that the intelligence range for these 300 elementary school graduates lies between 58 I.Q. and 156 I.Q., and the reading comprehension varies from third-grade reading ability to grade ten plus.

On the elementary level the pupil population represents an extremely heterogeneous group. As learning continues on the higher levels the wide ranges of differences in ability and achievement lessen as a result of (1) greater selectivity on these levels, (2) the dropping out of school on the part of many less able pupils, and (3) differentiation in courses to meet individual needs. However, anything that approximates homogeneity never can be achieved completely even on the graduate level of the university.

PROVIDING FOR INDIVIDUAL DIFFERENCES

Function of the school. What is meant by general achievement varies from school system to school system and even from classroom to classroom in the same grade within a school or school system. There is a tendency to place emphasis upon group ability to achieve better in one learning field rather than another as we refer to the children of one geographical area, social class, or school population as brighter or slower than those of another group. It must be remembered, however, that in any group there are individuals who deviate from the norm of the group. Since we supposedly are teaching individuals, not groups of individuals, it is the function of the school within its budgetary, personnel, and curricular limitations to *provide adequate schooling for every learner* no matter how much he differs from every other learner.

This is no easy task. Nor can we hope to accomplish it until or unless (1) we devise measuring instruments that shall help us to discover differences early and accurately; (2) we realize that children should be afforded the opportunity to achieve successfully within the limits of their potentialities; (3) the factors of the physical and social environment of each child are favorable to the development of success-stimulating native potentialities; (4) the schools are adequately provided with (*a*) sufficient and well-trained teaching personnel so that each

learner can be known by the teacher as an individual and taught as such, (*b*) curriculums that are adjusted to the needs and interests of the learner, and (*c*) adequate teaching and learning materials and learning aids for the stimulation of learning; and (5) all agencies of education, formal and informal — the school, the church, and the community — cooperate in the individualization of education in so far as this is desirable for the individual learner and society.

Special programs for individualizing instruction. The early years of the present century saw various large-plan attempts to meet the problems of individual differences. Probably no one of these projects is used at present in the form in which it originally was organized, but something of each has found its way into the accepted pattern of present-day school procedures.

The Dalton Laboratory Plan.[7] Initiated by Helen Parkhurst and put into operation in 1920 on the high school level, the Dalton Plan stressed the principles of freedom, group interaction, and what Miss Parkhurst refers to as the "psychology of the point of view," which, interpreted, means that a learner is motivated in his learning by understanding that which he is to do and by initiating his own activities toward the fulfillment of a goal.

According to the Dalton Plan, the school is to be regarded as a "house." Traditional classrooms become laboratories in which the function of the teacher is that of preserving "an atmosphere of study." The teacher suggests activities, answers questions, and holds conferences with the learners as these are desired by them. The learner's assignments are arranged in the form of contracts that may spread over an entire month. The learner is free to prepare his assignments in his own way with the help of the teacher, who guides him in the budgeting of his time and who, as well as the pupil, keeps "graphs of his daily progress." In this way it is expected that each learner will be enabled to proceed at his own rate and in accord with his individual ability to progress. Opportunity also is provided for such group activities as discussion on literary, historical, and other subjects of interest, games, athletics, dramatics, and similar programs that have socializing influences.

[7] H. Parkhurst, *Education on the Dalton Plan.* E. P. Dutton and Company, New York, 1922.

The Winnetka Plan.[8] Credit for this plan of individualizing instruction goes to Carleton Washburne, who in 1919 instituted an "individual technique" in the schools of Winnetka, Illinois. The educational philosophy underlying this plan is that a learner should be allowed to follow his own rate of learning in each of the subject fields that comprise his full curriculum. Basic to the carrying out of the plan is the need of discovering the individual's stage of learning for each subject and of building upon that rather than having him lock step with a group of learners who differ from him in stage of learning readiness. This plan necessitates the administration of examinations before a specific learning unit is undertaken in order to discover what that individual already knows.

Washburne began with spelling. Upon the basis of a pre-test he discovered just which of the spelling words of the term the child did not know. It was then the child's responsibility to master these words before the end of the term. The same technique was applied to reading, and later to other subjects, such as language, arithmetic, geography, and history.

Instead of the contract of the Dalton Plan, which kept the learner on the same level on all subject fields, the Winnetka Plan allows the child to proceed at different rates in different areas. He might be a year ahead in arithmetic, six months ahead in reading, and at his expected learning level in another subject. Learning units are arranged in the form of tasks or goals. Progress is checked by the learner himself by means of self-administered tests. In this way he can discover whether he is ready for a teacher test.

According to the Winnetka Plan there would be no failure since the child is measured against his own progress rather than in terms of the achievement of other learners. There is no skipping for the bright learner, but he does all the work in less time. The slower learner also is expected to complete his work, but he takes longer to do it.

The Project Method.[9] This plan of meeting the learning problems of individual pupils, as suggested by Kilpatrick, includes

[8] C. W. Washburne, "A Program for Individualization," in *Twenty-fourth Yearbook, National Society for the Study of Education*, Part II. Public School Publishing Company, Bloomington, Ill., 1925.

[9] W. H. Kilpatrick, *Foundations of Method.* The Macmillan Company, New York, 1925.

four types of projects: producer's project, consumer's project, problem project, and drill project. As a group of learners cooperate in the working out of a project, learning can be individualized for each member in terms of his interest and ability. The term project recently has come to be used for various types of activities that emphasize learning through doing.

The Activity Program.[10] As the term implies, the idea of active participation in learning situations rather than passive acceptance (or perhaps resistance) of teacher-dominated "learning" constitutes the ideal of the activity program. This program has gained in popularity in many school systems and is now in the stage of critical evaluation by educators, parents, and learners themselves. In general, the procedures of the activity program include arousal or recognition of interest on the part of the learner; planning of projects; pupil research; planning, organizing, and presenting exhibits and reports resulting from the particular "activity"; and an evaluation of the outcomes.

Grouping according to ability. Homogeneous grouping is based upon the principle that learners learn best in the company of their peers. Consequently, there has been a great deal of experimentation with various methods of grouping learners according to ability.

In any unselected group of learners there will be found a middle group approximating from forty to sixty per cent of the whole, the others deviating from the average toward the extremes of brightness and dullness respectively. If the instruction is geared to the needs of the middle group and the near deviates, as it usually is, there will be some at each extreme who will not benefit sufficiently from their participation in the learning situation. The extremely dull cannot compete; the extremely bright have too little competition. Discouragement is the lot of the former; boredom very often is the developed attitude of the latter.

Much has been done in the way of segregating the mentally retarded and of adjusting curriculums and teaching procedures to their limited abilities. Honors classes and honors schools or special schools have been organized for the superior. Difficulties arise when learners are divided into x y z groups — superior,

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[10] J. W. Wrightstone, *Appraisal of Newer Elementary School Practices.* Bureau of Publications, Teachers College, Columbia University, 1938.

average, and retarded. Children in the z (retarded) group a
well as their parents may resent the segregation. Moreover, con-
sciousness of intellectual "class" distinctions is emphasized. In-
tellectual differences do exist, but it is very easy for the x or
superior group to develop attitudes of snobbishness that are
resented by the other pupils, especially if the honors students
are accorded privileges denied to the others.

In addition to the social implications inherent in ability
grouping there is a fundamental weakness in the honors group
system. The members of these groups are selected from the mass
of the student body in terms of intellectual superiority and high
achievement in school studies. Other equally significant aspects
of personality may be neglected. Complete homogeneity of
grouping probably is impossible unless one could select from
a large student population those individuals who were most
alike in many aspects of their personality and who could work
together for the good of all. And yet is this truly a democratic
procedure? Who should be included in the "all"? However,
there are merits in ability grouping if all the factors involved are
considered and provided for and if the various groups are helped
to realize that they all have interests in common and can learn
to understand one another and to cooperate with one another.

Other methods of individualization. One method of recog-
nizing superior ability to achieve is that of promoting at a faster
rate or of "skipping" unusually able pupils. Even with very
bright learners, however, skipping may result in educational
gaps that affect future learning. Acceleration has been achieved
for bright pupils on the junior high school level by what is often
referred to as "rapid advancement," or the completing of three
years of work in two years. One disadvantage of this plan is that
the young person may be too immature emotionally and socially
when he reaches the senior high school to benefit from all of his
high school experiences.

Some young adolescents can achieve this social adjustment
very well, on both the high school and the college level. Other
become emotionally disturbed because of their felt lack of
oneness with the group. The authors have had experience with
both socially adjusted and emotionally disturbed bright young
students and are convinced that, before an intellectually superior
child is allowed to advance too far beyond his age group, there

should be found and utilized a means of measuring his emotional and social maturity as well as his intellectual capabilities.

There is a growing belief that *enrichment of curriculum* rather than *acceleration* is the answer to the problem of the mentally superior learner. Even with a relatively unsegregated class, a resourceful teacher can find many ways of stimulating his superior students toward horizontal growth in achievement rather than toward too rapid vertical progress.

The learner who has difficulty in meeting acceptable standards of performance can be helped in ways other than segregation if the deviation from the norm of ability to learn is not too great. Many young people fail to achieve because they do not know how to attack and master learning materials. Improvement in study habits often results in almost unbelievable improvement in learning achievement.[11]

Another practice that has been found valuable is that of the remedial teaching technique. The slow or unsuccessful learner is given special instruction, either formal or informal. This practice is especially beneficial to the pupil who has lost some of the regular work of the class because of absence due to illness. It also is possible that a learner has "missed the point" during the early stage of learning in a particular area. As a result he has difficulty in building upon that which he does not understand.

The giving of remedial instruction is complicated by the time factor. Shall a child who needs extra help in reading, arithmetic, or any other subject be taken out of his class group during the school day for this special work, or shall such help be given after school hours? Either procedure may result in loss to the child. While he is receiving special help during the regular school day he is missing activities which the other members of his class are enjoying and which to him may seem to be highly important. If he stays after school hours he may be distracted from the learning situation by his desire to be playing with his friends or engaging in one or another after-school activity. Also, to most children "staying after school" for any purpose other than that of engaging in self-initiated activities is extremely unwelcome. Of course, if the learner, of his own volition, asks for after-school help with his studies his emotional attitude toward his staying and the social significance involved are entirely different.

[11] See Chapter 14, "Developing Effective Study Habits."

Finally, individual differences do exist and provisions for them should be made. We must be careful, though, that we consider all the ways in which learners differ one from another. By attempting to eliminate or modify differences in one learning area we may be widening differences in other areas.

Certain forms of learning are fundamental to the adjustment of the individual to the society of which he is a member. The tool skills, common knowledges, and attitudes of understanding and cooperation constitute what may be termed the basics of a general education. All individuals whose intelligence level is above the definitely subnormal should be helped to achieve, within the limits of their capacity to learn, these educational goals. Upon such a general foundation of universal education should be built the development of whatever special aptitude or ability the individual may possess so that he can function in a particular area of achievement for the good of himself and the group.

QUESTIONS AND PROBLEMS FOR DISCUSSION

1. Discuss the ways in which individuals differ.
2. Select one of the classes in which you were a pupil on the elementary school level. Recall two members of the group who were discipline problems. How can you now explain their behavior?
3. List persons of your acquaintance who seem to show marked differences in their motor skills and capacity for abstract learning.
4. Explain with examples what is meant by readiness for learning.
5. Do you believe that failure to achieve in a desired learning area is less disturbing than denial of the right to participate in it? Explain your answer.
6. Compare the Dalton and Winnetka Plans. Which do you prefer? Why?
7. What is meant by an "intellectual hierarchy"? Give the pros and cons of any such grouping.
8. On which school level are individual differences most significant and from what point of view: elementary school, secondary school, or college?
9. How do you interpret the phrase "favorable conditions"?
10. What experience have you had in the matter of possessing a basic knowledge of the material of a course before you started the course? How did it affect your attitude toward the new work?
11. How is school guidance related to the problem of individual differences?

12. What are some of the advantages and disadvantages of mental age groupings?

13. If in high school you were a member of an honors class, evaluate your experiences in it.

14. Differentiate between general and specialized education with reference to individual differences among learners.

15. If a high school pupil gives evidence of unusual aptitude in a special field, should he devote most of his time and energy to the development of this aptitude to the neglect of other learning areas? Defend your point of view.

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Part IV

GENERAL PRINCIPLES OF LEARNING

LEARNING in any area can be facilitated or it can be retarded in terms of the extent to which teachers and students understand the principles that underlie the various aspects of learning. Psychologists differ in their explanations of the ways in which learning takes place. However, investigation and experiment have shown that successful learning tends to follow certain progressively formed patterns of thinking and doing. If these are recognized and utilized, they are likely to result in the attainment of learning success to the extent that individual potentiality to benefit from instruction is present. Some of the psychological fundamentals of learning, such as motivation, acquisition of skill and knowledge, development of power in the higher mental processes, effective study habits, as well as transfer in learning, constitute the subject matter of PART IV.

12

GENERAL THEORIES OF LEARNING

Learning is an active process that needs to be stimulated and guided toward desirable outcomes. External stimuli that induce learning include particularly the influence of the teacher through the assignments he makes, the questions he asks, the visual aids he employs, and all the other procedures that he utilizes to arouse learning interest and activity. However, the learner's inner responses are basic to the nature and kind of learning that takes place. Since learning is self-initiated, the learner himself so must be aroused that he will persist in the learning activity.

THE LEARNING PROCESS

Definition of learning. Learning is the acquisition of habits, knowledge, and attitudes. It involves new ways of doing things, and it operates in an individual's attempts to overcome obstacles or to adjust to new situations. It represents progressive change in behavior as the individual reacts to a situation or situations in an effort to adapt his behavior effectively to demands made upon him. It enables him to satisfy interests or to attain goals. Learning may be both vertical and horizontal — vertical in so far as precision in performance is increased or information is added to that already learned; horizontal in so far as what is learned is integrated and organized as a part of a functioning unit of expanding experience.

When learning takes place it can be expected that a more or less permanent change will be evidenced in the learner's behav-

ior. Such change may range from the acquisition of a relatively simple skill, item of information, or specific attitude to the mastery of complicated mechanical performance, understanding and application of difficult and abstract reading material, or complete reversal of previously exhibited attitudes and opinions. Much of learning is engaged in consciously by the learner and learning outcomes are recognized by him for what they are worth. As an individual goes about his daily activities, he unconsciously may acquire many changed modes of thought and behavior that grow out of his experiences. These may exercise a powerful influence upon his conduct and his relations with people about him. Learning, therefore, can be interpreted to mean:

Change in response or behavior (such as innovation, elimination, or modification of responses, involving some degree of permanence), caused partly or wholly by experience, such "experience" being in the main conscious, but sometimes including significant unconscious components, as is common in motor learning or in reaction to unrecognized or subliminal stimuli; includes behavior changes in the emotional sphere, but more commonly refers to the acquisition of symbolic knowledge or motor skills; does not include physiological changes, such as fatigue, or temporary sensory resistance or nonfunctioning after continued stimulation.[1]

There are various types of abstract learning. These include (1) memorizing learning material with little or no understanding of its meaning — mathematical formulas, for example; (2) gaining simple concepts, such as the fact that four objects added to five objects total nine objects; (3) discovering and understanding relationships involving responses that are logically and psychologically sound.

Learning is achieved (1) when learning content can be repeated *verbatim*, or (2) when new ideas have been gained from the material studied and can be expressed in the learner's own words. The first is called *rote* learning, by which is meant that as a result of study the learner can repeat the material *once* correctly. The more often he repeats the material the more likely he will be to remember it. Such additional repetition or study is called *overlearning*. The second method of achieving learning involves

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[1] By permission from *Dictionary of Education*, C. V. Good, editor, p. 237. Copyrighted, 1945, by McGraw-Hill Book Company, Inc.

an analysis and comparison of ideas that will cause new material to become meaningful to the learner. As the ideas are understood they can be integrated into a workable pattern.

Maturation and learning. The learner's stage of maturity is important in the learning process. Until and unless there is sufficient physiological maturity there will be little learning or what learning there is will be distorted. The child learns to walk only after he has reached a particular stage in his maturation process; he learns to read more easily only after he has reached his individual state of readiness for reading. Rate of maturation varies with individuals. In some learning functions, differences in maturity are measured in days; in others they may mean years. Because of our attempts at mass education, we have been providing learning stimuli that tend to start learners of a given chronological age to participate together in the learning of the same material. We have been asking all children to begin their learning of reading at about the age of six in spite of the fact that we now know that many children are not mature enough to read easily until they are eight or ten years of age. A child's learning depends upon environmental offerings as well as upon his own capacity and interests.

Experimental evidence has shown that practice is most productive when it is properly articulated with levels of maturation. Studies have been conducted in buttoning, cutting with scissors, and climbing a ladder, by Hilgard;[2] vocabulary training, by Strayer;[3] and crawling, walking, and prehension on the part of twins, by McGraw.[4] As a result of their experiments, all arrived at the conclusion that learning is dependent upon stage of physical and mental growth.

Learning outcomes. Purposeful activity is essential to mental development. An ultimate purpose as the director of behavior, such as the achievement of a definite goal, is an important factor in learning. The emotions also act as dynamic forces as they help or hinder the achieving of learning outcomes.

[2] J. R. Hilgard, "Learning and Maturation in Preschool Children," *Journal of Genetic Psychology*, 32 : 36–56 (1932).

[3] L. C. Strayer, "Language and Growth; the Relative Efficacy of Early and Deferred Vocabulary Training, Studies by the Method of Co-twin Control," *Genetic Psychology Monographs*, 1930, 8: no. 3 (1930).

[4] M. B. McGraw, *Growth, A Study of Johnny and Jimmie*. D. Appleton-Century Company, New York, 1935.

Effective learning results in the development of fundamental skills, social competence, or the mastery of abstract ideas — or all three. If an individual shows aptitude and competence in a skill or in skill subjects, he is considered to be *mechanical minded;* if he develops ability to deal with other people successfully, he is considered to be *social minded;* and if he can learn to deal easily and accurately with abstractions, he is said to be *academic minded.* As suggested in an earlier chapter, an individual may seem to possess learning proficiency in all three areas — mechanical, social, and abstract.

The development of skill is achieved by an individual only after he has given painstaking practice to the skill activity. The skilled tennis player earns his reputation through success in the playing of many games. The person who walks erect does so as a matter of habit based upon practice. Proficiency in preparing wholesome food usually is the result of long practice. Skills are developed as errors are eliminated and correct responses are retained and practiced.

The very young child receives much stimulation of the kind that causes him to become egocentric. As he grows old enough to walk and to talk, he needs a form of guidance that will enable him to adjust to his social environment. Social competence probably depends more upon environmental influences than upon biological inheritance. The child becomes social minded as he lives with other human beings — older persons as well as those of his own age. Much of the development of social competence is a form of emotional conditioning.

The development of reflective thinking constitutes a great challenge not only to the learner but to the teacher. This is the type of learning that is most vital to the individual. It is simple enough for a child to comprehend what is meant by a chair, a pencil, a horse, or a house since he has formed a mental image of each through direct experience with the respective objects. However, when words representing ideas rather than objects are used, such as mind, experience, and function, some learners experience difficulty in understanding their connotations. They have not learned to think abstractly. In order to become able thinkers, learners need to develop extensive vocabularies which are built upon adequate sensory and perceptual experience that constitutes a body of ideas.

THEORIES OF LEARNING

The connectionist theory. According to Thorndike, learning is a matter of bond connections — the formation and strengthening of neural connections between situations and responses. The stimulus affects the organism and a response can be expected. The S—R bonds can be considered either as physical conditions or as the relationships that exist between a given situation and the individual's ability to respond to it. Thorndike's laws of learning are expressed in terms of modifiability of neurons and neural connections. The S—R explanation of learning covers learning of any kind. In terms of this theory the essential factors in learning are readiness of the neuron, sequence in time, belongingness, and satisfying experiences.

The primary laws of learning as conceived by Thorndike are generally referred to as the laws of readiness, exercise, and effect.

Readiness. The principle of readiness is stated by Thorndike to be:

(1) that when a conduction unit is ready to conduct, conduction by it is satisfying, nothing being done to alter its action; (2) that for a conduction unit ready to conduct not to conduct is annoying, and provokes whatever responses nature provides in connection with that particular annoying lack; (3) that when a conduction unit unready for conduction is forced to conduct, conduction by it is annoying.[5]

Exercise. Within the law of exercise are included tendencies of use and disuse. These are defined thus:

The law of use. To the situation, "a modifiable connection being made by him between a situation S and a response R," man responds originally, other things being equal, by an increase in the strength of that connection.

The law of disuse. To the situation, "a modifiable connection not being made by him between a situation S and a response R, during a length of time T," man responds originally, other things being equal, by a decrease in the strength of that connection.[6]

Effect. The law of effect states that

To the situation, "a modifiable connection being made by him between an S and an R and being accompanied or followed by a satisfy-

[5] From E. L. Thorndike, *Educational Psychology, Briefer Course*, p. 55. Bureau of Publications, Teachers College, Columbia University, 1914. [6] *Ibid.*, p. 70.

ing state of affairs" man responds, other things being equal, by an increase in the strength of that connection. To a connection similar, save that an *annoying* state of affairs goes with or follows it, man responds, other things being equal, by a decrease in the strength of the connection.[7]

Listed below are Thorndike's secondary laws of learning that extend and amplify the three primary laws of learning:

> Multiple response to the same situation
> Attitude, set or disposition
> Law of partial activity
> Law of assimilation or analogy
> Law of associative shifting

The theory of bond connection between a stimulus (S) and a response (R) should not be interpreted to mean that any one stimulus or set of stimuli will lead directly to any one response or set of responses. The effect of the stimulus upon the organism is a potent factor — that which is satisfying directs toward, that which is annoying directs away from. However, the word "satisfy" as used in the law of effect does not necessarily mean anything that is pleasing. In the statement "a modifiable connection is strengthened by satisfaction, weakened by dissatisfaction," it is not inferred that pleasant things will be remembered longer than unpleasant. It now is known that punishment (annoyingness) may strengthen a bond and that unpleasant happenings may be remembered longer than pleasant ones. After he first formulated the law of effect Thorndike himself presented evidence to show that either *unpleasant words* or *pleasant words* can be recalled more readily than neutral words.[8]

Commenting upon satisfyingness or annoyingness as a factor of learning, Washburne says:

Satisfaction is important to learning when it means the satisfying of a purpose, or desire, or the satisfactory adjustment to imposed conditions, not when it means being pleased through no effort or intention of one's own, say, by hearing a word spoken. In the latter case, pleasure and displeasure have similar effects upon bond formation. But in the former case, where one's doubt, deficiency, or purpose is satisfied,

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[7] From E. L. Thorndike, *Educational Psychology, Briefer Course*, p. 71. Bureau of Publications, Teachers College, Columbia University, 1914.

[8] E. L. Thorndike, *Human Learning*. D. Appleton-Century Company, New York, 1931.

satisfaction has a special and direct bearing upon the preservation of associative complexes. Those responses which are influenced by the same desire or purpose (that is, seem to *have an effect* upon its satisfaction) thereby tend to become connected. And the more frequently and the more intensely this occurs, the stronger the connection becomes.[9]

Thus interpreted, learning becomes a so-called trial and error process that applies particularly to mastery of the more complex learning situations. In psychology, the term *trial and error* as applied to participation in unlearned activity connotes attempts at meeting the situation in various ways until the correct responses are found more or less accidentally. An example of this procedure would be the relatively aimless manipulation of a puzzle until the correct solution is reached. Since there was no planned procedure of manipulation, the solver of the puzzle probably would find a second or third, etc., attempt at solution as difficult as the first.

As the term trial and error is used in education, the element of aimless manipulation is absent. The learner is led to be conscious of a technique which might apply to the solution of a problem which he is attempting to solve. If his planned trial is not successful, he sets about consciously to correct any apparent errors in his technique and tries again to solve the problem. This process continues until the learner finally is able to eliminate the errors that he has been making and arrives at the desired solution. A repetition of the same or a similar problem will find the learner ready to apply his improved or learned techniques to an accurate and speedy solution of the second problem.

As other problems involving added difficulty are introduced, the learner begins with the basic knowledge gained through his previous experiences, and recognizes and attempts to master the new element. Success achieved in a series of increasingly difficult problems helps the learner to build up techniques of solution that can be applied in future problem-solving situations. He is gaining power through what might be referred to as a trial-correction-trial-success process of learning.

The school subjects that are most affected are those that require abstract thinking, such as science, social science, and mathematics. The teacher needs so to stimulate the mental

[9] From J. N. Washburne, in C. E. Skinner, editor, *Educational Psychology*, p. 305. Copyright, 1945, by Prentice-Hall, Inc.

processes of his pupils that each learner can discover for himself through the trial-correction-trial-success learning situations those concepts or relationships that serve his learning purpose.

The behavioristic theory (conditioned response). According to this theory, learning is habit formation resulting from *conditioning* or the associating of a stronger stimulus with a weaker stimulus to the end that the organism is enabled, as a result of this associative learning, to transfer the response ordinarily connected with the stronger stimulus to the weaker stimulus when the stronger stimulus is removed. Conditioning, thus interpreted, consists of setting up within the individual certain inner adjustments that will affect overt behavior. These inner adjustments are involuntary and operate automatically as stimuli to further action. In this sense they can be considered to be anticipatory adjustments. These anticipatory adjustments serve in cue reduction during the telescoping process and may be regarded as organic behavior that is in the process of being completed. Washburne says:

> The importance of anticipatory adjustment is great. It is the involuntary foundation of all voluntary behavior, it is the active desire which sets the goal toward which the organism strives in trial and error learning. It determines the "mind set," or organic pattern of readinesses and inhibitions. Without control of anticipatory adjustment, learning itself cannot be controlled.[10]

Pavlov's well-known experiments with dogs have shown that it is possible to transfer the cue stimulus that originally excites a response to another stimulus that will bring about the same response. Pavlov called this process a conditioned reflex. This conditioning is more easily achieved if the following principles of time, intensity, and consistency are adhered to:

> Time: "The response to the satisfier or annoyer stimulus must occur after the response to the cue stimulus has occurred and before it has altogether subsided."

> Intensity: "The second response must be stronger or more consummatory than the first."

> Consistency: "The second response must follow the first with relative consistency until the conditioned reflex is established." [11]

[10] Washburne, *op. cit.*, pp. 306–307.
[11] *Ibid.*, p. 308. Also see J. N. Washburne, "An Electro-Chemical Theory of Learning," *Journal of Educational Psychology*, XXVI, no. 2; 99–122 (1935).

Pavlov's experiments often are referred to as illustrating conditioning in learning. In one experiment Pavlov attached a tube to the salivary glands of a dog through an incision in its cheek. Provision was made for the careful collection and measurement of the·saliva that was secreted. The dog was made comfortable, and distractions were excluded as far as it was possible to do so. The observer remained in a sound-proof room, hidden from the view of the dog but able to view the experiment by means of a set of mirrors. Food was given the dog through automatic devices. As the food was presented a bell was rung. This combination of stimuli — food and ringing bell — was repeated until the bell alone became the stimulus that produced the salivary secretions. The dog now had been conditioned to the new stimulus.

There are certain observations concerning this experiment that are worthy of attention: (1) the bell stimulus caused the secretion of less saliva than the food stimulus; (2) the bell and the food were presented simultaneously during the conditioning process; and (3) the dog was "set" by hunger to be affected by the two stimuli.[12]

A simple conditioned response can be illustrated by the development in a child of a blinking of the eyes at the sound of a buzzer. Combine the sound of a buzzer with the eye blink caused by response to a quick-moving object, and after a number of repetitions the eyelid will blink at the sound of the buzzer unaccompanied by the moving object. The child is *conditioned* to the buzzer since he has learned to blink when he hears it.

Human beings as well as animals can be conditioned to respond to specific stimuli in given situations and to ignore other stimuli that may be present. These conditioned responses disappear in time. In human learning they are useful in dealing with functions that are to be learned in specific ways. Thus the vocabulary in a foreign language lends itself to conditioning by strengthening connections between a stimulus (French word) and response (English word), or vice versa.

In the learning of certain school subjects, automatic and consistent responses to stimuli (cues) are of prime importance. Automatic response rather than reflective thinking is needed in the learning of penmanship and spelling. The efficient learner

[12] See I. P. Pavlov, *Conditioned Reflexes*. Oxford University Press, London, 1927.

masters these to such degree that they serve as time- and energy-saving habits. The teacher should provide the proper stimuli or cues and use the principles of conditioning for those learning functions that need to be made automatic for most effective learning.

Conditioning of pupils by setting up regular patterns of classroom behavior to which the pupils become adjusted can be expected to develop habits of behavior that function automatically. Uniformity and consistency in dealing with children's tendencies toward nonconformity can do more for the achievement and maintaining of discipline than can bribery or severe punishment.

Insight in learning. According to the Gestalt point of view, learning is concerned with the whole individual and arises from the interaction of a maturing individual with his environment. Through this interaction there are established new forms of perception, imagination, and ideas. Together, these constitute insight, which operates as an individual attempts to find solutions to problems. The actual solution of a problem is no more important to the development of insights than is the fact that energy is applied toward a solution. However, insight is functioning when there is perception of the problem — an understanding of its difficulty, its elements, and its goal.

A *Gestalt* is the pattern, configuration, or form of apprehending (perceiving and understanding) a stimulus situation. Stimuli and responses are combined in an organized, unified pattern. The configuration or *Gestalt* loses something when it is broken up into its component parts, since every situation or experience is more than the sum of all its parts. A house is more than the bricks and plaster and other materials that are in the building. An airplane is more than an assembled machine. A book is more than a collection of words printed on paper. A learning situation is more than the elements of which it is composed. Hence, according to the Gestalt point of view, the situation should be learned as a whole rather than separated into its component parts and learned piece by piece.

The teacher, however, is confronted with the problem of deciding how large or how small should be the whole learning situation with which to deal at any one time. Certainly, all the areas of the globe in map form would be too complex to consider as a whole. Yet there is a size of map, poem, story, or musical

selection that if studied as a whole will yield maximal learning results. Insight in any subject results as the learner first attends to the general outline and later fills in the details. Art, music, literature, and similar subject areas that include elements of appreciation lend themselves to the Gestalt approach.

An individual has insight into a learning situation to the extent that he is able to understand the situation as a whole. The emergence of a solution to a problem is illustrative of insight that results from integration within the mental processes as an individual attempts to solve the problem. All the salient aspects of the problem need to be apprehended to arrive at its solution through insight. However, general insight should precede concern with precision, and accuracy of skills.

ASPECTS OF LEARNING

Interrelation of learning processes. Some of the explanations of learning as a process have been presented briefly in the foregoing section. Each of these points of view has been criticized by the proponents of other points of view. Such criticism is deserved if any one theorist attempts to explain all learning solely from his own point of view. Psychologists have come to agree that trial-correction-trial-success learning, conditioning, and insight are valuable as phases of the learning process if and when they are used appropriately.

Certain it is that all learning has to do with change. The changes that take place in human behavior, knowledge, and attitude as the results of or concomitants of learning are centered for the most part in the cerebral cortex. How these changes are facilitated depends in great measure upon the *goal* or the *purpose* of the learner and the *differentiation* and *integration* of the factors of the learning situation that make possible the attainment of the desired goal. The achievement of worthy outcomes, whether these be the forming of habits or the acquiring of social understanding and appreciation, is not dependent upon the utilization of any one principle of learning but upon the application of principles that fit a specific learning situation.

Goal-directed activity. When the learner knows and understands the goals to be achieved, he is enabled to direct his energies and attention toward their realization. In this connection the learner who keeps a record of his own progress either

in skill or in abstract learning is enabled thereby to adapt his successive responses in light of his present learning achievement. However, the learner himself may not always be aware of his own degree of progress. Hence another observer often is needed to identify the errors and successes made by the performer. The teachers should point out errors in thinking on the part of learners as well as mistakes made in the practice of a skill subject.

In the conveying of ideas to others through the spoken or written word, the individual must be concerned with the degree to which he actually conveys the meaning that he intends to convey to the person who listens to what he says or reads what he has written. The effective public speaker does not arrive at his high degree of skill as a speaker without a backlog of practice. As he speaks he has a purpose in mind. To achieve that purpose he must have learned to express his thoughts in words that can be comprehended by his audience and that will hold their interest. This example is but one of many that could be cited as an indication of the extent to which learning directed toward a specific goal becomes more meaningful to the learner and is more likely to impel him to study or practice than would be the case if he were engaging in unplanned activity.

Purposive activity implies the understanding of the goal, knowledge of what must be done to attain the goal, and practice aimed at that achievement. An experimental study by Longwell of functional changes in purposive activity presents an excellent picture of the steps that are followed in arriving at one's goal.[13]

Both the teacher and the learners should have knowledge of the goals or outcomes to be achieved during any learning situation. It is easier for the teacher to give stimulating leadership in learning activities or to guide the learning process when he himself understands fully the goals toward which he is headed. It is equally important that the learners be apprised of these goals, since cooperation is enlisted through goal-directed activity. Learners need to be helped to realize educational purposes rather than simply attempt to master an assigned task whose purpose is not revealed to them (or even known to the teacher) other than the "busywork" that it entails.

[13] See S. G. Longwell, "Progressive Change in Simple Action," *American Journal of Psychology,* 51:261–282 (1938).

Differentiation and integration in learning. Learning is both a process of differentiation and a process of integration. Learning that proceeds by the process of noting details in a situation, the general form or outline of which previously has been experienced, is known as the process of differentiation. As the individual is stimulated to systematize or to unify his many experiences or the things that he learns, integration in learning is taking place.

In differentiation the individual perceives the general outline, such as the size, shape, and general appearance of a room which he enters for the first time. As he remains and walks or looks about, he perceives item after item and is likely to direct his attention to those items that are related to his interest. Hence, what he sees is determined in part by his specific interest at the time.

Differentiation and integration are not independent processes that operate each without regard to the other process. They are interrelated and continue in their operation throughout the waking hours of an individual's life. Differentiation is one part of learning — a kind of preparatory process during which the efficient learner is engaging in the process of integration.

The function of differentiation is to distinguish meanings and to facilitate reading. The child should receive training in responding to details and in recognizing their relations to the whole. Configurations have to be identified as being different one from the other. In reading, for example, an individual learns to respond to the total effect of each word and to recognize it as a whole rather than to respond to each of the letters of which it is composed. Similarly, a child can learn to recognize a word the size of *automobile* as readily as he can the word *car*.

The details that emerge from a total situation are comprehended and combined with other details or particular aspects of learning and organized into workable mental patterns. During the development of a simple skill considerable integration takes place. However, in the acquisition of abstract ideas or concepts there is involved an intricate process of integration, including the discovery of the extent to which earlier experiences are related to the new learning material. More and more emphasis is being placed upon attempts to make education more functional — to integrate knowledge in various learning areas, such as history,

economics, literature, psychology, and related fields. The more effective the integration the more functional will be the learning.

The efficient thinker is able to organize his experiences as usable associations, incorporating new experiences as they are learned. To discover relationships between two situations or even two experiences is an important aspect of the integrating process. The present approach of both teaching and textbook writing is that of relating ideas and events rather than stating them as mere facts to be learned. History no longer is taught as a collection of facts arranged in chronological order but is organized into problems of human development. The worth of learning lies not in what is learned but in the value to the learner of the knowledge gained.

QUESTIONS AND TOPICS FOR DISCUSSION

1. State your definition of learning.
2. How important do you believe maturation to be in learning?
3. Why should not all six-year-old children participate in the same learning situations?
4. In what ways can the process of differentiation be facilitated?
5. Why is the conditioned response more usable with some subjects than with others?
6. Explain how insight assists learning.
7. In the learning of which school subjects is insight most valuable?
8. Discuss the importance of purpose in learning.
9. To what extent does the skilled performer have insight into the detailed operations involved in the skill?
10. Cite instances in which differentiation and integration function in learning.
11. On what bases have Thorndike's laws of learning been criticized?
12. From your own experience cite the value of doing the correct thing accidentally in a learning situation.
13. How do accidental errors interfere with efficient learning?
14. What are the strong points of the Gestalt theory of learning?

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ATTITUDES, INTERESTS, AND MOTIVATION

Psychological findings concerning children's developmental patterns have led to an increased appreciation of education as an active functioning process that involves not only the learner's ability to achieve but also his emotional reactions to the materials of learning. The degree of success that a learner can be expected to attain in his learning activities depends in great measure upon his own attitudes and his temporary and persistent interests.

Learning must be motivated in such way that interest in the content of study is built upon the child's existing interests. The attitude which the child brings to his task at the beginning of any learning unit should be strengthened if the attitude is desirable, and changed if this attitude interferes with success during the process of mastery. Moreover, if young people are to be helped in the achieving of constructive and satisfying attitudes and interests, educational opportunities provided for them must be motivated in such manner that learners do not remain content with the mastery of minimal essentials but are stimulated to achieve to the limit of their potentialities.

ATTITUDES AS AFFECTIVE EXPERIENCES

Meaning of attitudes. Attitudes, the affective by-products of an individual's experience, have their bases in his inner urges, acquired habits, and the environmental influences by which he is surrounded. In other words, attitudes result from personal desires and group stimulation. They actually are a part of an

individual's own personality but are affected by the attitudes and behavior of the group or groups with which he associates. For example, a child falls and hurts his knee slightly. If the members of his family display an attitude of great concern over the accident, the child probably will imagine that his knee hurts a great deal, and he will demand special attention or care. If, however, the child's family or playmates give little attention to his fall he is likely to forget it quickly and continue his play activities. In this connection, it also is true that people vary greatly in their attitudes toward other persons or their experiences. The injury to the child referred to above probably would have a different effect upon the mother of the child, a brother or sister, a playmate, or a bystander not acquainted with the child. In a situation of this kind, the child himself may be torn between accepting his mother's solicitous attention and demonstrating to his playmates that a little fall means nothing in his life.

Attitudes can exert a potent influence upon an individual. They act as causes as well as results of behavior. They are personal and are associated with the feeling tones connected with the individual's experiences. They represent the way he feels as he thinks, talks, or acts in any situation.

When a person is kindly, agreeable, tolerant, friendly, gay, and generally outgoing, he is considered to have desirable attitudes. The man or woman who habitually is disagreeable, critical, intolerant, unfriendly, or self-seeking is thought of as possessing attitudes disapproved by the group. It is possible for a person, however, to be sad at one time and gay at another, critical at one time and agreeable at another. The display of these attitudes in conformity with the circumstances that arouse them may be indicative of good personal adjustment. For the most part, an individual's attitudes sooner or later become habitual and are displayed by him in one form or another in his day-to-day living.

Attitudes operate in specific behavior patterns and are associated closely with emotional reactions. Most of an individual's experiences are either pleasant or unpleasant. The satisfaction or annoyance that accompanies any specific experience is the feeling tone of that experience and conditions the attitude of the individual. Attitude qualities vary in intensity with the strength of

the stimulation and the physical, mental, or emotional state of the person himself.

We are not born with our attitudes, but develop them as accompaniments of experience. Our liking for certain kinds of food, drink, games, work, music, or art has been cultivated through years of pleasant experiences, just as our dislikes have developed as results of failure to achieve or of annoyance associated with certain phases of our experience. Our attitudes are associated with everything and everybody about us. One may affect us favorably and another unfavorably. The former we seek; the latter we avoid whenever it is possible.

Attitudes grow and develop, as do other mental and emotional behavior patterns, in terms of an individual's reactions to his environment. They also alter his developmental patterns as he continues to experience a kind of give-and-take between himself and his parents, his teachers and his associates, as well as other environmental stimuli. According to Woodworth, an attitude is "a set or disposition (readiness, inclination, tendency) to act toward an object according to its characteristics so far as we are acquainted with them." [1] He suggests that when an attitude is inactive it may be called a *disposition*, and when an attitude consists of strong feeling it may be called a *sentiment*.

What one says in contrast to what one feels is sometimes referred to as *language attitude*. Real attitudes sometimes are submerged in the habit patterns of the individual while he is expressing the attitude which he wants another person to believe that he possesses. "Excuse me" has more value when it is translated into active behavior than when it is expressed merely in oral form. This is a fact that teachers need to consider when they are dealing with their pupils. Young people are prone to give verbal expression to attitudes which they believe will meet the approval of the teacher, although their real attitudes may be very different. The individual (child or adult) whose language and habit attitudes harmonize is the honest, sincere, and forthright individual who earns the respect of his associates.

Unconscious attitudes. Children are not always aware of the attitudes that influence their behavior. These unconscious attitudes account for much of their inner conflict and give direction

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[1] R. S. Woodworth, *Psychology*, Fourth Edition, p. 392. Copyright, 1940, by Henry Holt and Company.

to the development of their personality. Young people are not always aware of the effect of their behavior upon parents, teachers, or other children. Their motives may be misunderstood. This fact holds not only for children and adolescents but also for adults. For example, a person may be quite selfish without realizing the complete effect of his attitude upon others who live with him, work with him, or associate with him. He often believes that if he does a good turn it is representative of unselfishness. He may not realize that he is forcing a service upon another person because of the satisfaction that he himself experiences from the act rather than because he is interested sincerely in being helpful. Elders often try to be very helpful to young people, but they do not realize that their assistance would be more appreciated if it followed the interests of the young person rather than the will of the older person.

The everyday life of a child presents many examples of behavior motivated by unconscious attitudes. A child believes, for example, that he is very fond of a relative and is demonstrative in the latter's presence. If that relative is generous with gifts, it very often is the gift and not the person that is the recipient of the child's attention. In the classroom a child may seem to be extremely interested in his work, and he earns success in it. Too often, unconsciously, the child's efforts are directed not at the mastery of the subject matter as such but at utilizing his abilities in order to impress a classmate or the teacher, or to gain a high mark. What is the fundamental attitude of an adolescent girl who is extremely interested in clothes? Does she dress smartly to attract boys, to impress girls, or to satisfy her own ego?

Social attitudes. Concern for the welfare of others as well as of oneself is an attitude that should be encouraged in the child as early as possible. Individuals who exhibit a positive approach to a problem or to relationships with associates are well on their way toward solving the problem and toward making friends.

In order to understand social behavior, we must realize that attitudes aroused in the group are closely allied to the characteristic behavior of its members. We are *set in attitude* to conform to the conduct expected of us by others. This readiness permits certain actions and inhibits others. Children as well as adults develop a state of readiness consistent with their stage of development to react to the mere presence of people regardless of who

they are. Certain set attitudes become habitual motivators of the behavior of the young child in the home, the older child in the classroom, the adolescent in the presence of members of the opposite sex, and the adult in his place of business. Through proper guidance children can be helped to develop attitudes of courtesy and dignity that may influence their social behavior for the remainder of their lives.

Attitudes are contagious. Children are great imitators of attitudes, which are caught as they are taught. They learn many of their attitudes from their parents, their teachers, and other older associates. Parents may attempt to force their attitudes upon their children, often with little or no success. However, as the members of a family live together and as the elders express their attitudes concerning people and current issues, children tend to develop the same or similar attitudes without realizing that they are doing so.

Political views, religious affiliations, and social interests sometimes follow the same general pattern from generation to generation. In a study made by Newcomb and Svehla data are presented that seem to indicate a substantial correlation between parent and child attitude concerning war, communism, and church affiliation.[2] Attitudes of politeness, respect for others, courtesy, and the like are readily imitated by children. Precept alone is not enough. If elders wish young people to possess desirable attitudes, they themselves must present examples that are worthy of imitation. Attitudes are affected by suggestion. Their development and direction can be conditioned by a word, a glance, or the general behavior of a person whom the child trusts and respects.

Attitudes and age levels. As was suggested above, children's attitudes are imitative rather than based on reason. A child tends to fall in line with accepted group attitudes. He acts with little understanding of the reason for his behavior. What he does often is divorced from his best interest.

An adolescent's attitudes are more personal, and directed by his own individual drives. Behavior on the part of elders that interferes with his freedom may stimulate adolescent antagonisms. The teen-ager may come to feel that adults are intolerant

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[2] T. M. Newcomb and G. Svehla, "Intra-family Relationships in Attitude," *Sociometry*, 1: 180–205 (1937).

and nonunderstanding. He considers himself to be "broad-minded." Actually his attitudes are biased in terms of his personal wishes and felt needs. His behavior may be motivated by an attitude of self-sufficiency or a belief in his own personal power and rightness.

In general, an adolescent's attitude is hopeful and forward-looking. He is driven by an urge to reform the world. Although his attitude toward a particular child or older person may be one of impatience, he has a kindly attitude toward children as a group and pity or sympathy for those who are very much older than himself. Toward the members of his own age group his attitude is conditioned by his relations with them. The teenager may be resentful of those who possess superior advantages or who seem to receive more attention than he does. He may exhibit an attitude of superiority toward other young people who appear to be less able or less successful than he is. Teachers of adolescents might be surprised or even shocked if in some way they could read the thoughts of some of their students toward other members of the class even during one class recitation period.

Sometimes young people's attitudes come to the surface in moments of excitement. One of the authors recently was observing a student-led forum on topics selected from the day's news. The class consisted of unusually bright and enthusiastic young people. Everyone was eager to participate in the discussion. So excited did the group become that some of its members could not restrain themselves if the student leader called upon someone else to discuss a topic upon which these young people wished to speak. As a result, not only were disapproving glances shot at the leader but expression was given to their attitude toward her in remarks such as "She's always unfair," "She always picks her friends," and similar comments. The teacher of the class was amazed at this display of unfriendly attitude as she had believed that this particular girl was very popular with her classmates.

Acquiring attitudes. Individual attitudes are developing moment by moment. Some of them are formed without direction; others are the results of careful planning by a person or persons who desire to encourage the development of certain attitudes in others. One function of the school is that of stimulating young people toward the acquisition of attitudes that are

individually and socially desirable. Much of citizenship training is a matter of attitude formation. Membership in one or another political party may be based upon an emotional attitude rather than upon a real understanding of the principles or platform of the party. A persuasive leader declares his position and presents his arguments. Often, without evaluating his statements, his adherents accept his position and are guided accordingly. The development of intelligent attitudes toward governmental affairs is an important responsibility of school people, especially teachers of the social studies.

The values that young people attach to the activities of their school life are as important as the skills and knowledges they master. If through his study of mathematics, physics, or social studies, for example, a learner achieves a scientific, unbiased attitude toward people and the world about him he is gaining much more than the mere mastery of facts.

It is through imitation, emotional experiences, and deliberate efforts on the part of the individual himself, teachers, and others, then, that new attitudes arise. As we have said earlier the child is a great imitator and builds most of his attitudes in that way. The adolescent is conditioned by emotional upheavals, by his enlarging adjustment problems with expanding groups, including members of the opposite sex. Consequently, he acquires new and less stable attitudes. He may fall in love at first sight and not be aware of the stimuli that are inherent in the experience. He may earn success in science and thus come to admire his science teacher, or he may have difficulty in his history class, with the attendant attitude of blaming his teacher for his failure to master the subject.

In his environment, the child constantly is being stimulated by influences that affect his attitudes either desirably or undesirably. Radio and television broadcasts, motion picture programs, and the vast amount of printed reading matter that is available all contribute to the attitude development of those who are stimulated thereby.

Teasing and tormenting others is engaged in by most of us. This activity has certain socializing benefits. However, teasing activities are undesirable if they are directed at persons (especially children) who are suffering from one or another form of defect. The physically handicapped should be helped to accept

their handicap and to develop right attitudes toward it, themselves, and their more fortunate associates. A child's social attitudes may become warped if his schoolmates tease him because he has freckles, a crooked nose, or eye difficulties. The too stout or the too thin child often is made miserable by older people as well as by youngsters his own age.

Importance of attitude. Attitudes offer great possibilities for successful achievement as well as failure in life. They are an important motivator of behavior and affect all human values. Efficiency results when a person is impelled by his attitude to start, continue, and complete a project rather than to avoid an unpleasant task. His attitude toward his work affects his worthwhileness in the activity. His attitude toward others determines his social value. If the individual can learn to forget self and to be of service to those who need help, he has achieved personality characteristics that are essential to the gaining of appreciation from others. If he does not feel superior to the work that he is doing or to the people with whom he is associated, he is likely to succeed in his work and in his social relationships.

A child should not be permitted to do completely as he wishes. He should be stimulated toward desirable activity through the arousal of interest in worth-while projects. Constructive, objective attitudes encouraged during childhood serve well during adolescence. The attitude of the teacher, of the parent, or of a group leader is important. Each should display the kind of objective but understanding attitude that will be a good attitude for the child to imitate. Parents sometimes tend to overrate their children and excuse them for behavior and attitudes that are considered undesirable by others. Teachers, on the contrary, sometimes become so professionally objective toward their pupils that the latter develop the kind of attitudes toward teachers that are exemplified in "teacher cartoons." There is a middle ground for both the teacher and the parent.

We usually differentiate between reputation and character by saying that reputation refers to what people think one is but that character is what one really is. One's character traits soon stand out as those that constitute a part of his consistent behavior. Character education must include the development of right attitudes as well as the acquisition of behavior habits that are socially desirable. Not only should rules and regulations concerning

good conduct and effective study habits be taught, but they should be understood and appreciated in the light of their values to the individual and society. The child should be aided in making deliberate choices of behavior in harmony with his own and social betterment.

INTEREST AS RELATED TO LEARNING

Meaning of interest. Interest may refer to the motivating force that impels us to attend to a person, a thing, or an activity; or it may be the affective experience that has been stimulated by the activity itself. In other words, interest can be the cause of an activity and the result of participation in the activity. The direction of our thinking is influenced as our own interests are related to the situation in which we find ourselves. Our behavior, in turn, is affected by the sensory experiences and perceptual awarenesses that make possible the changing of relations among ideas and thought processes as these are experienced and expressed. The dynamic nature of experience gives rise to a dominance of one idea at this moment and of another at the next. However, basic to the change of ideas in terms of existing environmental conditions is the influence of experience-born interests that direct our mental pattern. We may not be conscious of the fact that the very dominance of one idea over another is a selective process motivated by our interest or feeling at the moment.

Children have few if any natural interests but acquire various interests as a result of their experiences in the environment of which they are a part. The teacher is concerned especially with discovering the interests already acquired at any stage of learning so that he may plan his instruction to meet differing levels of experiential interest. Moreover, the teacher is motivated toward so planning his guidance of the learning that he will make it possible for each learner to develop interest in what he is learning as he continues his study. A teacher's own enthusiasm for and interest in the learning content is extremely valuable as a means of arousing and maintaining a similar degree of enthusiasm among his pupils in mastering learning material.

Interests are closely related to drives, motives, and emotional responses. Interest in the preparation of palatable food may stem from a desire for good food; interest in scientific research,

mechanics, or teaching, for example, may grow out of exploratory acts stimulated by a desire to satisfy one's curiosity about these activities. The interest of young people in their appearance, clothes, or activities (such as dancing or study) may be an awakened desire to attract members of the opposite sex, or to win approval from an admired adult. It is the responsibility of educational agencies to provide an enriched environment for children and young people in order to stimulate learners' interest in a great many worth-while activities.

Interest and effort. Work cannot be completed without the expenditure of effort. The more difficult the task, the more energy is required to do a good job. Learning is no exception to this generalization. Complete mastery of a subject or a skill may require much detailed attention-giving. Fortunately, however, the drudgery aspect of school work can be removed as interest is introduced into the activity.

An already awakened interest in a subject field will in all likelihood keep a student thinking in that area until he masters the subject. Successful achievement, in turn, will increase his interest, which may continue through life. Pupil interest in mathematics, science, a foreign language, or any other subject may be based upon real talent in the particular field. As study of it continues, greater proficiency is accompanied by increased interest not only in the field itself but in related areas. Not all young people start a new field of study with the interest factor already operative. Some students develop an interest in a subject area as a result of the influence of the teacher, a classmate, or a member of the family. However, if such students have average ability or above, they usually can develop a strong interest in the subject and exert a degree of effort in its mastery that will lead to successful achievement.

Interest and fatigue. A condition of fatigue may be produced by physical or mental work that causes poisons or *toxins* to accumulate in the body. Often, however, what is considered to be fatigue actually is loss of interest in the activity in which the individual is engaged. Continued reading of a textbook may cause a young person to report eyestrain and arouse in him a desire to stop studying. However, if he turns from that book to a novel or other book of interest, he is able to continue reading for hours without further evidence of fatigue or eyestrain.

Sometimes a person is so engrossed in what he is doing that he is unaware of the passing of time or of the physical discomforts which he is experiencing. In fact, that very thing is happening to the writer at this minute. He has been working at the typewriter for several hours but has just realized that he needs to get up and stretch his weary body. Learners have the same experience. A mother visited the dean of a high school one day and asked if it was necessary for her daughter to study until two or three o'clock in the morning. The girl was an excellent student and did not need to spend an undue amount of time on her school work. When she was questioned by the dean concerning the long hours spent in home preparation, the girl's answer was, "Yes, I know that I do not get enough sleep but I become so interested in my work that I don't feel the least bit tired, and do not realize what time it is until mother makes me go to bed."

If a pupil is very much interested in a specific project he is likely to do both more and better work, although in a few instances that interest may cause him to work beyond health limits. With many learners the opposite is true. The apparent fatigue that seems to accompany studying often is no more than boredom accompanied by a desire to engage in other activities of temporary or immediate interest. Learning efficiency can be increased if the learner realizes that the values to be derived from study are greater than the immediate satisfaction of giving in to a temporary interest, such as participating in social activities during the school week. However, children as well as adults need rest and relaxation. The preservation of good health and the achievement of success in school work require that every young person be afforded opportunities for well-planned recreation as well as a program of interesting work.

Duration of interest. The ability or willingness to continue at a given task for a definite length of time varies with age and among individuals. For a very young child the duration of interest in a specific activity is short. His interests change constantly; yet he wants to be active. He may be selective in his activities and may prefer to engage in some rather than in others. However, his interest lies in activity for its own sake rather than for the attainment of a definite goal. Hence he can be distracted more easily from one activity and become interested in another than can an older person.

One sign of maturity is considered to be the ability to stay with an activity until it has been completed unless time or difficulty factors interfere. In other words, duration of interest should increase through the years until maturity is attained. Any flitting of interest on the part of an older adolescent or an adult is indicative of an immature or childish attitude toward goalful activity. This does not mean that the kind of activity in which an individual engages because of interest should not and cannot change with age.

Effect of many interests. Immediate interests sometimes must be denied in order that more permanent and more worth-while interests may be satisfied. Young people constantly are faced with the dilemma of conflicting interests. They must decide whether to devote most of their time and energy to satisfying social and individual interests or to concentrate on study so that later they may be able to continue their education or gain proficiency in a vocation. Adolescents, especially, differ in this respect. Some of them seem to live mainly for the satisfying of their immediate growing-up interests; others are so fired with ambition that they deny themselves participation in immediate and interesting activities in order that they may prepare themselves for the realization of a remote but much desired goal.

An interest may become so absorbing that other possible and equally desirable interests are neglected. A proper balance of interests is an important factor in the personality development of young people. If a person of any age becomes too much interested in *things* he may lose interest in people and become anti-social. On the other hand, if he develops an absorbing interest in people, so much of his time may be devoted to social activities that he becomes increasingly unable to concentrate on serious work.

In many schools, especially on the secondary level, this interest factor constitutes a problem that requires definite teacher attention. In most schools with an extensive program of cocurricular activities, it is usually found that some students want to participate in a great many recreational activities to the detriment of their school work. At the other extreme are pupils who refuse to participate in any out-of-class projects for fear that these may distract them from the serious business of learning. Teachers themselves need to take care lest they become so in-

terested in their pupils and their school work that they devote an undue amount of their time outside regular school hours to concern with their professional activities. Teachers as well as learners should budget their time so that it includes school work, participation in home activities, and wholesome recreation.

There is a limit beyond which an individual should not go either in dispersing his interest areas of activity or in concentrating all his interest and activity in one area. The high school student who can master any subject that he studies often finds that he has an interest in several vocational fields but is unable to decide which one he should pursue. He needs help in meeting this problem by being given intelligent advice concerning the study areas in which he should concentrate. His other interests then can be directed toward development of hobbies or relaxing activities.

THE MOTIVATION OF LEARNING

Motives. In order to understand human motives there is needed an appreciation of the basic desires that are present in all normal human beings. As an aid to the process of development from birth onward, a human being's behavior is influenced by a host of potential desires and cravings that operate as the driving forces of his life activities. The amount of satisfaction or annoyance that he experiences in any situation is determined by the extent to which his urges and interests are gratified or thwarted. Motives, arising out of natural urges or acquired interests, are dynamic forces that affect thoughts, emotions, and behavior.

The individual is born with certain potential urges or drives that seek expression. The kind of behavior in which he will engage to satisfy these inherent desires is conditioned by environmental influences and experience. These experientially modified drives to action then become the motivators of attitudes, interests, and activities.

The relatively simple behavior drives of early childhood increase in number and complexity as an individual matures and experiences more and differing life relationships. A careful observation of human conduct at any age level leads to the conclusion that an understanding of motive is very useful to a parent or teacher who is concerned with the education of a child. It is not always easy to discover the actual motivating

force that stimulates one to act as he does, since behavior often reflects the functioning of more than one kind of urge at the same time. In general, as a result of education, a person is motivated to satisfy bodily needs adequately, to realize a purpose or an ideal, or to achieve personal satisfaction in a socially desirable activity.

Motives are potent factors in learning. (1) *Motives encourage a learner in his learning activities.* The early school child can be stimulated to do good work through praise from the teacher, or the earning of stars or other extrinsic rewards. The motive for the child is not so much mastery of learning material as it is the receiving of special recognition. As the child grows older, other motives activate his learning. Extrinsic rewards still play a part — as they do even on the adult level. However, other motives that are more directly concerned with personal well-being become more significant. For example, an adolescent may give special attention to those of his subjects that he considers practical and that will be of value to him as a means of earning a living. One often hears a student complain that he sees no reason for studying a foreign language or mathematics. From the learner's point of view there is no motive to be satisfied through expenditure of energy on a subject that, at the time of the learning, appears to have no practical value.

(2) *Motives act as selectors of the type of activity in which the person desires to engage.* For example, a newspaper means different things to different people. A young man may turn first to the sports page, while an older man's first interest may be in the stock market report. The "woman's page" may attract the mother, while the youngsters avidly read the comics. Each in his choice gives expression to the motives that are basic to his particular interest at the time. Many other examples could be cited to show the extent to which people of all ages react in terms of their motives or special interests. As one watches children go about their daily activities he may wonder about the motives that underlie their behavior. From the adult point of view some of their activities seem pointless, although the children themselves are giving expression to ideas or interests that have definite meaning for them.

Moreover, motives not only select what we do but the way we shall do it. Why does one learner prepare his homework in one

sequential order and another young person follow a different order? In the solving of a problem the order of an individual's responses or the actual responses made are selected in terms of his own interests. For example, some students begin their home study with the most difficult subject, others with the easiest.

(3) *Motives direct behavior.* Growing girls often are heard to complain about household chores. If asked why they do what they do not want to do, their answer invariably is "But I must." Their explanations of the *must* vary — either they do not wish to earn disapproval or a reprimand from their mothers, or they feel that their mothers have too much to do, or as one girl put it, "I suppose if I want to eat, I ought to help in the preparation of something to eat."

Motives as directors of behavior are extremely important in the learning process. The learner must be helped to want to learn that which he should learn. Unless the learner can be led to see meaning in his learning activities he is likely to be unsuccessful in his achievement.

Motives as energizers, selectors, and directors of activity are closely related to interests and attitudes. It is almost impossible to isolate any one function of motives from the whole pattern of inner compulsions that express themselves in overt behavior. It is important that teachers understand this interrelationship among motives as they attempt to stimulate their pupils toward interest in learning.[3]

Significance of motivation. Motivation is concerned with the arousal of interest in learning and, to that extent, is basic to learning. The teacher is ever on the alert to discover stimuli that will produce pleasant feelings or satisfaction in order that the interest of the learner shall be maintained long enough for him to master definite ideas or subject matter. No lesson plan is considered complete unless it includes motivation. The teaching approach that is an integral part of the learning procedure often serves as the most effective form of motivation. The teacher attempts to relate the content of the new learning material to experiences with which the learner is familiar and which give him satisfaction.

It is not sufficient, however, merely to develop an immediate

[3] For a more complete discussion of motives in learning see B. R. Bugelski, *The Psychology of Learning*, Henry Holt and Company, 1956.

or temporary interest. The learner must be so motivated that his interest will be directed toward a definite goal which will take him far beyond the experiences which are used as motivators toward further learning. It is the teacher's responsibility to build upon the experience level of the learner and at the same time so direct the latter's attention to the key ideas that he will discover for himself those salient points. These new experiences, then, in so far as they are satisfying to the learner, will serve as motivators toward further learning.

Important as motivation is in arousing learner interest, too much time and energy should not be given to this part of the lesson. Interest for its own sake can retard rather than encourage the mastery of new ideas. Education is serious business, and a teacher should not try to entertain simply to interest or motivate learners. Motivation is effective only when it gives a mental set toward learning. Otherwise it is a distracting rather than a directing force.

Attention and interest. To give attention is to engage in mental activity. Attention can be directed toward objects, people, or one's own thoughts and emotions. To give attention is to direct one's thinking toward a particular idea or to alert one's self to certain sounds, sights, or other selective stimuli in one's environment. The kind of stimuli to which an individual gives attention during his waking hours depends upon many factors, such as age, interests, attitudes, training, and ability to think abstractly. A person's attention is given to certain stimuli in a situation rather than to others. He responds to change, to objects of unusual size, to stimuli that are different in intensity from others in the situation, to stimuli that are repeated, to moving objects, or to anything that is unusual. These are some of the factors of interest and attention upon which motivation of learning can be based.

Need for continuous motivation. Continuous motivation is needed in order to help learners concentrate on the learning material. A child's attention has a way of moving from one thing to another during a lesson period. Successful learning results to the extent that a learner is encouraged to give as much of his attention as is possible to the subject under discussion rather than to allow his thoughts to wander in the direction of other interests, such as a test that he will have in another subject, plans

for the week end, or the pupil who sits next to him. We sometimes refer to this wandering of attention as daydreaming — a form of mental activity that is common among young people.

It is a psychological fact that attention fluctuates from one stimulus to another. Many stimuli are present in the classroom, each competing for the attention of the learner. Therefore, he needs help from the teacher to enable him to bring his attention back to the subject of the lesson as he tends to be distracted by other stimuli in the situation. The more stimulating and interesting the subject matter and its presentation, the more likely are the mental operations of the learner to focus on the ideas under consideration.

The value of competition. The development of a competitive spirit is desirable if, through wise use of it, the teacher can arouse in learners the desire to make learning progress. Competition may take one of two forms — competition against another person or competition against one's own record. If the learners are relatively equal in mental ability and power to perform, competition between learners or groups of learners can be stimulating and wholesome. If, however, the less able are placed in competition with the more able, more harm than good is likely to result. Competition of one group against other groups, if managed wisely, gives training in cooperation and in the acceptance of defeat. Interscholastic athletics exemplify group competition. Unfortunately, however, only a relatively small number of young people participate in such competitive activities and gain training through them. The others benefit to the extent that they identify themselves with their team and learn to react with good sportsmanship to team success or failure.

In classroom situations too much emphasis upon competition may develop undesirable behavior habits. Some learners will resort to fair means or foul in order to avoid defeat. They may cheat on a test. They may develop delinquent behavior in order to gain group attention or to minimize their unsuccessful achievement in the regular classroom work. It is only as attitudes of personal honor and integrity are encouraged that pupils can be helped to refrain from such activities.

An increasing amount of attention is being given by school people to the value of stimulating a learner to compete with his own past record. A powerful incentive in learning is the knowl-

edge of the progress made. Hence a learner should be encouraged to chart his own progress. A learner usually responds to expressed recognition on the part of a teacher of the fact that there is improvement in learning. Hurlock studied the relative efficacy, as a means of stimulating learning, of the use of praise, blame, and ignoring by the teacher. In general, older children and dull children responded most to praise. The brighter the child the more likely he was to be affected by blame. Boys responded to both praise and blame more than did girls.[4] According to Luba, children can be motivated to do better work when incentives such as prizes are offered than when there are no incentives. His findings seem to show also that dull children respond to extrinsic rewards more often than do the bright.[5]

Motivation through rewards has certain definite advantages. It is a positive approach and directs the attention of the learner to the degree of success that he has achieved. It also utilizes the human desire for approval. There is danger, however, that the extrinsic reward becomes more important than the intrinsic values of learning. Achieving a star may constitute a desirable motive for the child in the kindergarten or in the early grades in the same way as earning a diploma or a degree is satisfying to older students. The real rewards of learning probably are not recognized by an individual until such time as he is able to put into successful practice that which he previously has mastered.

Since all learning is self-initiated it is the teacher's responsibility so to stimulate the learner that he becomes responsive to the significant factors in the learning situation. The child who enters into the activities that have been planned for the group and the young person who continues his learning into adulthood achieve a degree of competence that is denied to those who are apathetic in the learning situation and who are not motivated toward self-improvement. Finally, effective learning is motivated by a teacher who possesses a dynamic personality and who reflects in his own attitudes and interests the influences of a broad and rich experience.

[4] E. B. Hurlock, *The Value of Praise and Reproof as Incentives for Children*, Archives of Psychology No. 71, Columbia University, 1924.

[5] C. L. Luba, "A Preliminary Experiment to Quantify an Incentive and Its Effects," *Journal of Abnormal and Social Psychology*, XXV: no. 3: 275–288 (1930).

QUESTIONS AND TOPICS FOR DISCUSSION

1. What is the relationship between attitudes and human behavior?
2. To what extent do your opinions differ from your attitudes?
3. How have your attitudes been affected during the past two weeks?
4. Give examples to show that a child's interests change more rapidly than do those of adults.
5. How can a socially unacceptable interest be changed to a socially desirable one?
6. Give examples to show that attention is influenced by such factors as change or size of objects, intensity or change of stimuli, color, or repetition.
7. When you go to a museum, to what do you attend? When you walk along on the street, what do you notice? When you study, to what do you give your attention?
8. Explain what is meant by concentration of attention.
9. Why do you enjoy teasing another? Is this practice desirable?
10. What is your attitude toward teachers? politicians? newspapermen? policemen? funeral directors? baseball players? etc.
11. To what extent should a teacher attempt to motivate learning?
12. To what extent should interest accompany learning?
13. What techniques have teachers used to motivate your learning?
14. To what extent is motivation associated with effective teaching?
15. Note the things that attract your attention or interest you. Explain the reasons for attending to these particular things.
16. Study the interests of children and of adolescents and record any differences that you discover.
17. Evaluate the use of praise as a motivating force in education.
18. Enumerate some of the devices that teachers have used to hold your interest or to call your attention to points in a lesson.
19. What are some of the motivating factors in out-of-school learning?

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14

DEVELOPING EFFECTIVE STUDY HABITS

STUDY can be interpreted as a planned program of subject matter mastery. It is essential to learning and fundamental to school life. Its chief purposes are (1) to acquire knowledge and habits which will be useful in meeting new situations, interpreting ideas, making judgments, and creating new ideas, and in the general enrichment of life; (2) to perfect skills; (3) to develop attitudes. The term *practice* refers to the repetition of an activity in order to perfect performance. Study usually is associated with reading and reference work, but it also is related to the solution of problems arising in daily life activities. For example, before a mechanic can repair an automobile he must study the extent and nature of the difficulty or the damage. He does this by first-hand investigation of the situation. He arrives at a decision concerning what needs to be done after he has studied the problem. Successful achievement in any form of activity is based upon study, interpretation, and application.

PROBLEMS OF STUDY

Meaning of study. Study implies investigation for the mastery of facts, ideas, or procedures that as yet are unknown or only partially known to the individual. Any application of energy directed toward the learning of new material, the solution of a problem, the discovery of new relationships, or similar purposeful activity can be considered to be study. There are numerous reasons for a person's desiring to study. He may wish to discover

a new way of washing clothes, of traveling to the top of a mountain, of preparing tasty meals, of stimulating pupils in their learning. Hence he sets about studying in order that he may learn or master all he can concerning the particular situation, object, or procedure.

If an individual wishes to get ideas from the printed page, he will direct his energies in terms of the particular purpose or aim that he hopes to achieve. His purpose may be to obtain a general over-all impression of the written material. He may be in search of specific data or information. The basic interest in reading the material may be to analyze critically the content of the reading matter or the style of the writer. The sole objective may be that of gaining emotional stimulation from what is being read. Study requires a purpose, and what one learns as a result of study depends largely upon the degree to which one succeeds in achieving that aim or purpose. As one studies it is possible, of course, to gain values other than the primary one desired at the moment.

Need for study. Learners, whether they be children in the third grade, pupils in the high school, or college students, often give evidence of ineffectual study habits. To a few learners success in study comes not by training in how to study but rather by the development of study procedures that they may have discovered by accident and that seem to serve their purpose. Since study usually is connected with a gaining of ideas from the printed page, the learner's need actually is that of attempting to grasp the thoughts of a writer. When the experiences of the reader and of the writer have been similar, the reader's interpretation of the written material is made quite easy. The difficulty is increased if there is a gap in the experiences of the two, since the reader interprets what he reads in terms of his experiences previous to the time of the reading. This accounts for many of the interpretations that a reader may give to the words on a printed page that were not intended by the author.

Although for a number of years college students have constituted a selected group, failure is still one of the great tragedies in the lives of college freshmen. It is true that there are factors other than poor study habits that account for this failure, but lack of training in study takes its toll. In his investigation of the problems connected with study, Butterweck reports that

freshman students do not succeed in their study activities largely because they lack a purpose; read in small units; or fail to take proper notes, to summarize or to recall, or to answer questions dealing with the reading material.[1]

Those students, either in high school or in college, who succeed especially well usually study alone and follow a study technique that has been worked out by themselves and that incorporates desirable procedures. The success factor alone gives the honor student a purpose. When this purpose is linked with a selected vocation or life work, the learner's energies are focused still further on mastery of learning materials, and he thereby is enabled to concentrate on the subject area of his interest. The successful student has learned how to alternate work with rest so that fatigue does not interfere with his successful achievement. He has learned to read rapidly, to take notes, to attend carefully to classroom discussions, and in other ways to master subject matter. He has discovered what for him are good study habits.[2]

Since study requires energy, it often is regarded by pupils as distasteful. The teacher's function is to help learners find ways in which their study may become as pleasant and as successful as possible. Many learners need continued guidance; others can develop for themselves good study procedures that will achieve desired results.[3] On every school level there are learners who make comments similar to the following and actually believe the truth of their statements: "I cannot study alone." "I can study best when I am listening to the radio." "My best studying is done late at night." "I study best early in the morning." High school and college students are prone to hold these fixed ideas concerning their study habits.

Problems connected with study. Pupils should be helped to evaluate critically their own study habits so that they may discover their weaknesses and then try to improve their study efficiency. Each learner should be encouraged to examine his study habits in relation to the principles suggested below:

[1] See C. T. Morgan and J. Deese, *How to Study.* McGraw-Hill Book Company, New York, 1957.

[2] See J. D. Weinland, "How Successful College Students Study," *Journal of Educational Psychology*, 21:521–526 (1930).

[3] See M. E. Wagner and E. Strabel, "Teaching High School Pupils How to Study," *School Review*, 43:577–589 (1935).

1. Study involves more than mere reading of printed material.
2. Efficiency in study is increased when it is based upon a plan or purpose.
3. Words, phrases, and sentences should be read thoughtfully and in context.
4. Some study material can be learned best by the whole method.
5. Cramming is an undesirable study method for good learning results.
6. Good health and sufficient sleep and recreation are essential to the achievement of good study results.

In addition to these suggestions there are many other study conditions that affect habit and practice. Some are desirable; others are undesirable. Most learners are faced with the problem of discovering adequate answers to the following questions concerning the determination of *how, when, where,* and *under what conditions* study should be undertaken.

1. Should study be attempted on a train or a bus?
2. Should all study be limited to school?
3. To what extent should the school library be used in study?
4. Can studying be done best in a quiet room?
5. Is it imperative that studying be done in a room apart from the other members of the family?
6. Does the radio interfere with study?
7. Should a definite time of the day be assigned to the study of certain learning materials?
8. For how long a period should study be engaged in without rest?
9. Is the best studying done alone or with classmates?
10. Does the taking of written notes help in studying?
11. How closely should a time schedule for study be followed?
12. Can effective studying be done in the presence of distracting influences?

The amount and kind of study in which a learner engages differ with his age and grade level. During the early years of schooling the child masters fundamental learning tools, habits, and attitudes as a result of classroom stimulation, with little if any independent study. As the young person passes through the later grades of elementary school, high school, and college, study materials become increasingly more abstract. The learner's techniques and habits of study need to be adjusted to changing learning materials, purposes, and desired outcomes.

FACTORS THAT AFFECT STUDY

Attitude toward study. As was noted earlier, specific attitudes accompany learning experiences. The attitude that is "caught" differs with each learning experience. If the learning experience is pleasant, the learner's attitude usually is positive, and he is impelled to continue the learning. If it is unpleasant, he tends to avoid it. The pupil who likes history, arithmetic, or English usually is the one who has succeeded in it. The pupil who dislikes intensely geography, Latin, or psychology no doubt has had an unpleasant experience in his attempts to master it. Negative attitudes toward study sometimes find expression in comments similar to the following:

"I study but I can't remember what I study."

"The lessons are too long."

"I know that I will fail that test."

"I don't see why I must study this subject. I will never make any use of it anyway."

"I don't understand the assignments."

Comments such as these are expressions of negative attitudes that are more likely to hinder than to help the effectiveness of study. Successful learners adopt positive attitudes toward their study—they do not waste time or energy fretting over what they have to do.

An entire class may dislike a particular subject. In such a situation the teacher's first responsibility is so to motivate the lessons that the learners will develop a change of attitude toward the subject. The teacher should avoid the direct approach that may seem to be forcing the subject on his students. In a situation of this kind his attitude should be somewhat like that of a skilled salesman. If there appears to be a feeling against the product on the part of the prospective customer, the experienced salesman directs the attention of the unwilling customer to something that will interest him. A return to a consideration of the product to be sold will be made only after the salesman has won the confidence of the prospect. Similarly, the teacher can make effective use of class time by stimulating interest among his learners even though he may seem to be deviating from consideration of the actual study material to be learned. Skillful motivation can do much toward developing

attitudes in learners that will influence them toward study in the specific area.

When learners adopt the attitude of "the subject is too difficult" the fault often lies with the teacher and not the subject. The teacher can help learners to engage in good study procedures, and he can so present his material that it will be more easily understood. Confidence is strengthened in any situation as those who are participating in it are made to feel that they can earn reasonable success in the activity. It is the individual who has succeeded in similar situations who develops the attitude of "I believe I can do it," and then sets about to complete the task—be it study or any other form of purposeful activity.

Attending to the task at hand. In the solution of a new problem the learner needs to have at his command a workable body of usable facts on which he can focus his attention as he attempts to analyze the problem. He must be able not only to analyze the situation but also to utilize material already learned. He should have the ability to select and to adapt to his immediate purpose from whatever body of knowledge he already possesses concerning it those elements that will lead to workable inferences. The ability to focus attention and to apply meanings helps a learner arrive at solutions.

It is easier to direct attention to what one is doing if the goal to be achieved is not too far distant. If the goal is too far removed from present activity and too difficult to reach, and if one's ability does not seem to be too closely related to the demands of the activity, there is experienced greater difficulty in keeping attention on the task at hand. For example, Latin is generally considered to be a desirable prerequisite for the study of medicine. However, a long time must elapse before the student of Latin becomes a successful practicing physician. Hence a boy may be tempted to be careless about his daily study of Latin grammar. If he can focus his attention upon the ultimate value that Latin may have for him, he can persuade himself that if he ever expects to attain the remote goal—the practice of medicine—he must make a satisfactory adjustment to his study of Latin.

Fatigue in studying. Studying seldom causes fatigue even though energy is required to engage in mental work. *Feelings of fatigue*, however, are known to result if study conditions are

unfavorable. Inadequate lighting, extremes of temperature or humidity, poor posture, subnormal physical conditions, emotional disturbance, or boredom in connection with the activity may produce severe feelings of fatigue.

An enthusiastic attitude toward what one does, an interest in subject matter mastery, and a desire to achieve success—all tend to remove the fatigue elements. This does not mean that a learner should study for a long stretch at a time, without rest. He needs change of activity, either mental or physical, if he wishes to avoid feelings of fatigue or actual fatigue. Boredom rather than fatigue is likely to result when a pupil engages in study activities against his will. However, if he is very much interested in the achievement of success, rarely will he experience boredom during study unless his study habits are extremely inefficient.

Distracting influences. An individual may believe that he cannot concentrate, that his powers of attention are inadequate, or that he actually is inattentive. His trouble may be that he has developed bad habits of attention. He may have failed to develop resistance against allowing himself to be distracted by interesting stimuli in his environment. To the extent that interest in *what he is doing* increases he is likely to be less attracted by extraneous factors.

A school building located alongside a main highway or busy street, or a house situated near a ball park gives rise to so many distracting influences that extra effort is required if the learner is to concentrate his attention upon study content. Experimental evidence indicates that noise and other distracting factors decrease learning efficiency and cause an individual to waste energy. However, it is possible to become adapted to these stimuli and thereafter do efficient work despite their presence.[4]

Sometimes extraneous stimuli are utilized to step up a learning process. This fact is exemplified in the rhythmic learning of typewriting. Rhythm also has been used in factories to speed production. However, unless these stimuli are related in some way to the learning unit, the distraction caused by their presence is likely to interfere with successful achievement.

Children like to listen to radio programs and are tempted to

[4] N. E. Orchard, *Study Successfully.* McGraw-Hill Book Company, New York, 1953.

combine listening to them with their studying. They train them-
selves to keep busy with their lesson preparation while they are
stimulated by a stream of music, story, or news broadcasts that
run on and on. These competing stimuli tend to offer less and
less distraction to study the longer they are experienced. Stu-
dents sometimes claim that radio stimulations seem to satisfy
them, although they do not actually follow the program. Even
so, potential distraction is always present, and in the long run
the most effective studying is done in a quiet room.

In an attempt to discover the effects of radio listening on
study efficiency Miller conducted an experiment with sixth
and seventh grade pupils consisting of thirty-nine boys and
forty-six girls. He concluded that:

1. There is little or no significant difference apparent in efficiency
of reading-type study directly ascribable to presence or absence of radio.

2. What slight differences appear seem to indicate that the boys
were affected more quickly by the experimental situation than were
, the girls.

3. The results of this study indicate that considerably more research
should be done in this field.[5]

Familiarity with extraneous stimuli may result in almost
complete disregard of their presence. In the early days of air
travel, an airplane passing a schoolroom window distracted the
attention of the teacher as well as that of the pupils. So common
a sight have airplanes become that the chances are that pupils
studying either in the classroom or at home no longer are aware
of their passing overhead.

In study, as in travel, it is not how rapidly one moves along
at any one time but rather how consistently he can keep going
once he has started. It is not uncommon for a learner to dis-
cover as he starts studying that there are other activities which
should claim his attention. No matter how important these
other activities may be, he should dismiss them from his thinking
and concentrate on his studying. Unless the other demands
on his attention are exceedingly pressing, he will tend to forget
them once he has become thoroughly engrossed in his study
activity.

[5] L. R. Miller, "Some Effects of Radio-Listening on the Efficiency of Reading-
Type Study Activities," *Journal of Educational Psychology*, 38 : no. 2 : 105–118 (Feb-
ruary, 1947).

Distractions are not all caused by external stimuli. How the person feels, the effect upon him of the emotional experiences of the day, the worries that he is experiencing, the attitudes toward study that have been established, or the attitude that has been developed toward the particular field of study may act as a distractor to the favorable mental set that is so necessary. Mild emotional experiences are conducive to good study conditions, but strong feelings of fear, worry, anger, or even affection may cause concentration in study to become almost im- -possible. In order to offset the effect of these internal distracting factors, the learner needs to be impelled by a strong urge·toward successful achievement.

SUGGESTIONS FOR LESSON PREPARATION

Need for clear and definite assignment. A learner of whatever age can achieve a mental set for study when he understands the purpose of the study and the materials included. If after a lesson has been assigned a pupil is tempted to give expression to such statements as "What does he want?" or "I don't know where to find the material," the teacher has failed to guide his pupils toward interested and effective study activity. The assignment should be clear and definite and should be understood in detail by all who are expected to complete it. It is helpful for the teacher to direct attention to the specific facts and ideas that are to be mastered. Little impetus toward study can be expected to result when the teacher does no more than assign, for example, "the next ten pages" for homework.

Reading for ideas. Reading requires the mastery of ideas. These ideas need to be associated with those already acquired. Book material should be read not merely for the words contained in it but for the ideas that these words are supposed to reveal. Knowledge of the meaning of each word in a sentence is not always sufficient for the reader to gain the fineness of meaning that the author attempted to convey. The reader tends to read into the words the results of his own experiences rather than those of the writer. This accounts in part for the variety of meanings that may be gotten from the same reading material by different individuals.

If mistakes can be made in interpretation of reading material when all the words in it are understood by the reader, how

much greater will be errors of interpretation when the material contains significant words the meaning of which is unknown to the reader. The exact meaning of such words should be discovered before the learner attempts to gain ideas from the written passage. The dictionary habit should be developed early, although it is possible for thoughtful readers to gain an understanding of individual words from the context. In fact, no matter how familiar a word, a phrase, or a sentence may be, the reader needs to be able to recognize its relationship to that which precedes and that which follows in order fully to understand and appreciate the writer's point of view.[6]

Poor reading habits often are basic to study difficulties. Learners differ in their rate of reading. The more rapidly an individual reads, the more ideas he is likely to get from the materials read. His reading also may be increased in rate by the fact that he is reading for a definite purpose. A slow reader tends to give attention to each word or to separate phrases, thus decreasing his reading efficiency since the thought must be carried in mind as the reading progresses. Rapid and careless reading is as ineffectual as slow and unconnected reading. Best results are obtained by the quick, careful reader, although the slow, careful reader also can be expected to gain mastery of ideas, if he is given sufficient time. Psychological differences in reading rate and comprehension are extremely important, and learners' habits in these respects should receive teacher consideration.

Value of whole and part methods of study. The terms "whole learning" and "part learning" are relative in their connotation. The size of the unit to be mastered should determine whether there should be whole or part learning. For example, to attempt to master the contents of an entire book by the whole method probably would constitute an impossible task for the ordinary learner, but an entire chapter may not be too much. Similarly, a complete poem can be learned by the whole method unless the poem is too long.

Whether or not a pupil utilizes the whole method in studying learning material as against studying it part by part depends mainly upon the study habits that have been encouraged by the teacher in regular classroom learning situations. It is important

[6] See P. Witty, *How to Become a Better Reader*. Science Research Associates, Chicago, 1953.

that a learner use the method that best suits the specific study situation in which he is participating. If a learner has been helped to develop habits of memorizing that will ensure for him adequate mastery of subject matter, his study activities will become correspondingly successful.

Mastering difficult learning material. It is a good practice for the learner to read an entire book assignment rapidly to discover the general purport of its content. Then he should read it a second time, examining it in greater detail. Hasty reading should be avoided at this time. Hurried study and mastery of ideas are not compatible. Lack of concentration upon the ideas presented in assigned reading material tends to encourage undue interest in distracting elements in the immediate environment. The good student is the one who overcomes these distractions by developing a self-discipline that serves his study interests well.

A re-reading of study material should reveal the difficult parts unless the teacher already has directed the learner's attention to them. The student should learn to select the important ideas and practice recall in relation to them. The final test of effective study is the delayed recall which is operative when the student needs the ideas in classroom recitations or testing. Hence whatever is studied should be studied with intent to recall. Teachers can stimulate the development of this study habit by bringing each student into the classroom discussion daily.

Mastery also is dependent upon the practice of making mental, summaries of the material read. After reading through an assignment for general ideas the learner should attempt to make a mental summary of the salient points that are related to each topic. This kind of summarizing gives experience in organizing and unifying the ideas gained from study.

Value of outlines and notes. The practice of outlining study material or of making notes of particularly difficult facts usually is very helpful. Teachers recognize the value of this technique as they organize the important points of classroom discussion in outline form on the blackboard during the lesson.

Notes on reading material that are written by the learner as he engages in his study activity are more useful if they are arranged in an organized or outline form rather than jotted down haphazardly. Students differ in the form of outline that they find most useful, but teachers can do much to develop a learner's

ability to organize learning material in logical form. In the preparation of an assignment, material that is outlined as it is read can be added to during the process of re-reading the assigned material. Fixation of ideas and readiness for recall are improved by the learner's reviewing and concentrating on study material that is arranged in sequential order. Subordinating minor ideas to the major ones through this process of outlining also helps to clarify the learner's thinking.

Responding to specific questions. Questions often appear at the end of chapters in textbooks to assist learners to consider further the ideas presented in the chapters or to encourage them toward original investigation. A good assignment includes questions posited by the teacher that will direct the attention of the learners to the salient points of the reading material. The teacher should be fully cognizant of the ideas contained in the reading material and should be able to suggest questions that, as the learner attempts to answer as he reads, will help him to discover the real import of the ideas presented by the writer.

It is also a good study practice for a student to formulate his own questions. As he works with a teacher in a subject area he can learn to "spot" the important points to be considered. As he raises his own questions he is preparing himself to recall significant ideas when they are needed the next day or the next week. Knowledge gained through the formulation of answers to questions is likely to be remembered longer than knowledge gained through study effort directed at attempts to remember all ideas regardless of their relative importance. A few general questions, however, may not be sufficient to bring out all the ideas that should be learned. This is especially true in the social sciences. In addition to so-called key questions, attention should be directed to questions dealing with more or less minute details that, presented in proper sequence in relation to the main questions, help to further understanding and mastery. Even slow learners can follow ideas that are presented in proper sequence and with appropriate emphasis. Every learner gradually should develop a critical attitude toward his own power to read, to think, to master, and to re-present.

Relating new material to the old. Learners should come to realize that rarely does one learning unit stand alone. Learning is a continued process of building new concepts, ideas, and

knowledge upon the basis of previous experience. Consequently, before a student begins to prepare his learning assignment for the next day he should review briefly either mentally or by reference to his class notes the material considered in class on that day. This rather narrow interpretation of building the new upon a foundation of the old should be extended by the learner as he associates any ideas or forms of knowledge that he has achieved in other learning areas to his new learning situation, to the extent that these other experiences are pertinent to the present situation. In a departmentalized organization of study fields learners too often fail to utilize all their experienced body of knowledge, regardless of the particular subject with which it seems to be closely related.

Using various sources of study. Regardless of what the topic may be, different authors usually treat it differently. This is especially true of writings in the social sciences, although it also is true of the more exact sciences. Learners should be encouraged to consult various authors or sources of information if their study is to be more than a mental fixing of the point of view of one authority. Although it may seem easier and sometimes more desirable for a learner to become thoroughly acquainted with one treatment of a topic or subject, the learner's experiences are likely to be enriched through added research. Moreover, flexibility of thinking can be achieved only through wide reading and experience.

Interpreting charts, tables, figures, etc. With an increase in knowledge of the value of visual aids in learning has come an extended use of charts, tables, and figures as learning aids. The cartoons in the comics give the young learner practice in responding to visual aids of the chart and picture variety. He recognizes the fact (often without understanding its implications) that a picture, a cartoon, a figure, or a table can tell a story that may take pages to relate in words. Children then are mentally set to respond to interesting visual aids that appear in textbooks, if they are encouraged to do so by their teacher. However, many textbook illustrations need to be interpreted in order to have value. Here again it is the teacher's responsibility to help pupils to interpret material of this kind.

Too many readers pass over apparently complicated tables and charts that are included in the text. If encouraged to give

attention to them, a learner will find both interest and profit in his use of them. The learner may use these objectively presented data to check the conclusions of the author. As he studies charts, tables, maps, formulas, and the like, he may find that he does or does not agree with the author's interpretation of the data presented. This constitutes a challenging situation which can do much to increase the learner's interest and his desire to master the real facts.

Summarizing and reviewing. The assimilation, organization, and application that accompany a learner's attempt to summarize what he has been studying comprise a most fruitful learning operation. It is in this way that learning experiences are made functional. The learning habits of every learner should be so guided that he achieves facility in the art of summarization. The better his ability to summarize, the easier it will be for him to review. The rapid forgetting that takes place shortly after learning is overcome in part by a periodic summarization of the salient points of the material studied. Further, as compared with his present understanding, a learner's concepts may have been meager while he was mastering the subject matter. Summarization and review give him an opportunity to reflect, recall, and evaluate ideas in the order of their importance.

STUDY HABITS AND SCHOLARSHIP

Need for a plan. A task, a plan, and freedom to work are basic to good mental adjustment. Too little do young people realize that those who succeed in life follow a well-laid plan of activity. The artist, the tennis champion, the proficient teacher, the surgeon, and all other men and women who have won recognition for their achievement have attained their proficiency through careful adherence to thoughtfully constructed plans.

During the elementary, junior, and senior high school years learners usually are helped by their teachers to organize their study time. However, when these same learners go to college and are expected to plan their own study time, they may have a mental and emotional set against doing so. They seem unable or unwilling to plan their study activities adequately if their freedom is thereby interfered with. The result is that many lowerclassmen experience low grades or actual failure before they are willing or able to discipline themselves.

The learner of whatever age who can and does make an inventory of his time and who plans his daily work (including study) is developing habits that will help him to succeed not only during his school days but thereafter. The idea of a plan for study frightens some learners largely because they have never made a plan nor worked according to one. Nevertheless, if the work for each day and the time for doing it are planned, greater enjoyment and efficiency will result.

The budgeting of one's work has a tonic effect somewhat like the budgeting of one's money. The individual knows what he can do and sets about to use his energies accordingly. He plans to have recreation in the fresh air and sunshine and does not worry about the time spent in this activity since he has set aside enough time to complete his work activity. His emotional tensions thus are reduced. He has learned to concentrate his energies on the task at hand, and not to worry about the next one until the time for participation in it arrives.

Achievement and amount of study. Habits of successful study cannot be developed in slow and careless learners by presenting them with a set of rules. Clear thinking arises out of the following of orderly and systematic plans for study. To study intelligently is to apply the psychological principles that underlie motor and perceptual development and the various thinking processes.

In a study reported by Bird and Bird the average number of hours spent in study by college students was found to range between 18 and 24 hours a week. These investigators point out that the amount of time spent varies with the week of the term, but that most students do most of their studying during the first four days of the week, leaving week ends free for recreation and social activity.[7]

In Figure 15 is presented the distribution of the study hours of students as reported by Bird and Bird. A glance at the figure reveals (1) that the subjects of the investigation varied greatly in the amount of time they devoted weekly to study (from less than 4 hours to almost 56 hours); (2) that during the fall semester the students on the average devoted more time to study than did the students during the winter and spring semester;

[7] See C. Bird and D. M. Bird, *Learning More by Effective Study*, p. 53. D. Appleton-Century Company, New York, 1946.
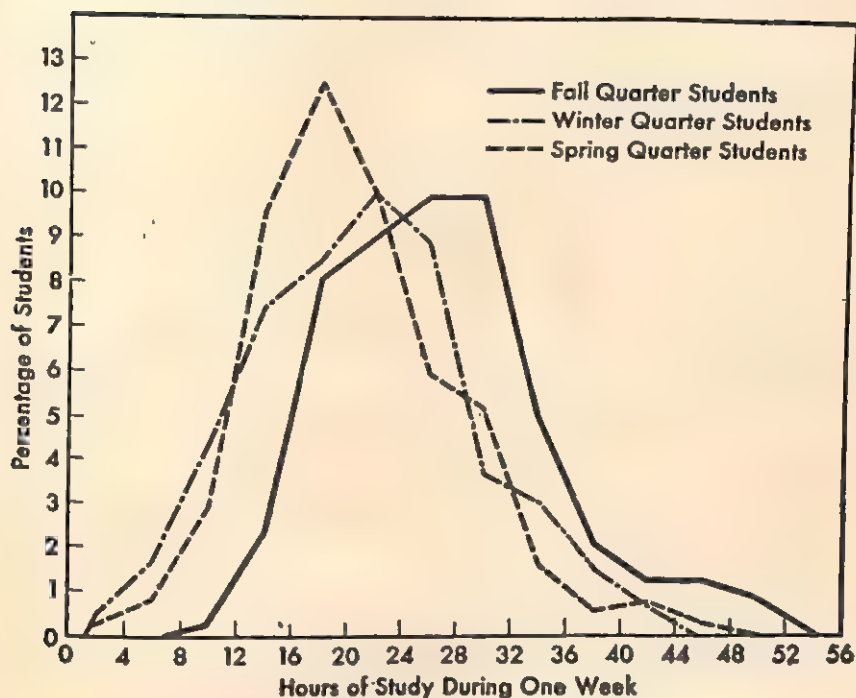
FIGURE 15. *Curves Showing the Hours of Study During One Week for 108 Fall Quarter Students, 57 Winter Quarter Students, and 53 Spring Quarter Students Enrolled in "How to Study" Classes in a State University*

From C. Bird and D. M. Bird, *Learning More by Effective Study*, p. 56. Copyright, 1946, by D. Appleton-Century Company.

and (3) that a few students need help in planning a study program.

An analysis of the time spent weekly by 113 college students in each of a number of activities is presented in Figure 16, from the same study by Bird and Bird. It can be noted that on the average these students spend more time in study than in class or laboratory attendance. Individuals vary, however, as the authors indicate: "Though the average figure is 57 there are some students who sleep only 43 hours a week and others who sleep 70 hours. Some students spend 4 hours a week at meals, and others spend 22. Social activities require 34 hours a week of some students' time, but, unfortunately, other students spend no time at all in social pastimes." [8]

Distribution of study time. Learners vary in the amount of time they devote to continuous study without rest. School

[8] *Ibid.*, p. 58.
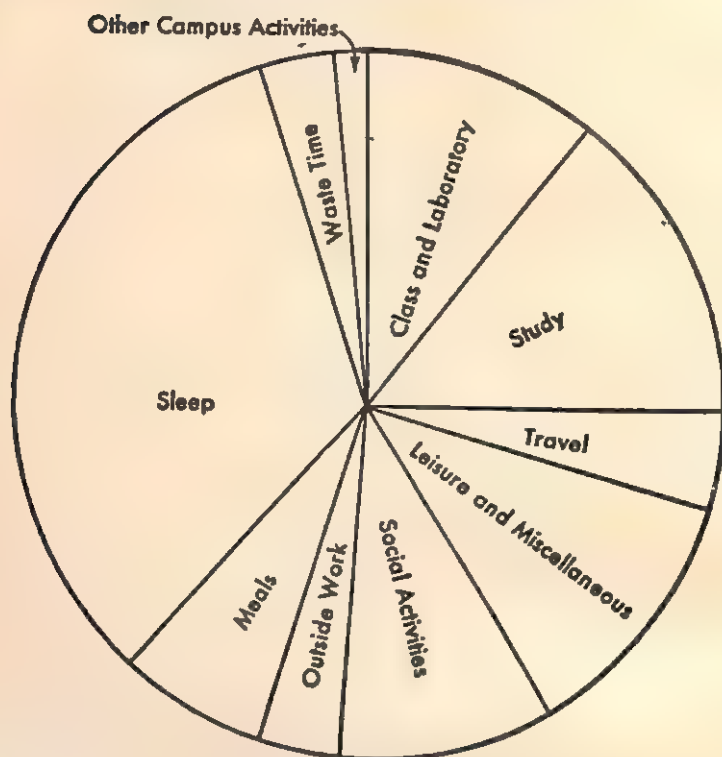
FIGURE 16. *Proportion of Week Devoted by 113 College Students to Each Named Activity*
From C. Bird and D. M. Bird, *Learning More by Effective Study*, p. 57. Copyright, 1946, by D. Appleton-Century Company.

programs, on the contrary, usually are arranged so that the length of time devoted to concentrated study shall be suited to the age level and stage of mental development of the learner. A young child is not kept at any one learning activity for more than ten or fifteen minutes at a time. On the high school level a pupil usually spends from forty to forty-five minutes in one recitation period, while a college student spends fifty minutes and the graduate student about 110 minutes per class period.

There is experimental evidence to support the assumption that distributed effort is more effective than effort applied continuously. Lashley found in his work with rats that rats given ten trials a day required 57.8 trials to learn a maze but that rats given two trials a day required an average of 21.5 trials to learn the same maze.[9]

[9] K. S. Lashley, "A Simple Maze: With Data on the Relation of Distribution of Practice to Rate of Learning." *Psychobiology*, 1918, 1: 353–367 (1918).
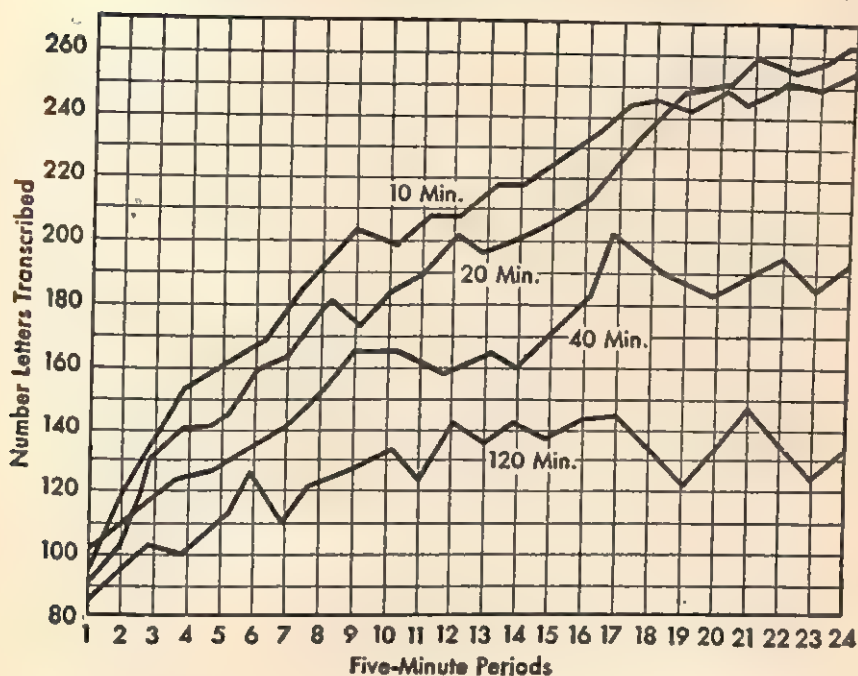
FIGURE 17. *The Effect of the Distribution of Work on Learning to Substitute Numbers for Letters*

One group worked 10 minutes twice a day for six days.
One group worked 20 minutes once a day for six days.
One group worked 40 minutes every other day for six days.
One group worked 120 minutes at one sitting.

From *Educational Psychology* by A. M. Jordan, p. 209. Copyright, 1928, 1933, 1942, by Henry Holt and Company. (After D. Starch, "Periods of Work in Learning," 1912.)

Experiments in human learning that attempt to discover whether distributed learning or concentrated learning is more effective yield results similar to those of Lashley in his studies of animal learning. One of the earlier experiments is that of Starch,[10] who used human beings as subjects in a learning situation that consisted of transcribing prose by writing appropriate numbers into squares opposite each printed line. He found (see Figure 17) that the least efficient group was the one that spent its time in one continuous learning situation. Best results were

[10] D. Starch, "Periods of Work in Learning," *Journal of Educational Psychology*, 3:209–213 (1912). See also L. F. Kain and R. de V. Willey, "The Effect of Spaced Learning on the Curve of Retention," *Journal of Experimental Psychology*, 25:209–214 (1939). J. R. Gentry, *Immediate Effects of Interpolated Rest Periods on Learning Performance*, Contributions to Education, No. 799, Bureau of Publications, Teachers College, Columbia University, 1940.

obtained by the 10-minutes-twice-a-day and the 20-minutes-once-a-day groups.

The results obtained from experiments dealing with the distribution of practice periods can be applied by the learner to his planning of study time. The time that a learner needs to devote to study should be spaced rather than continuous. As is true of length of class recitation periods, the amount of time given to continuous study should vary with the age and grade of the learner. Elementary school pupils probably should limit the length of a continuous study period to not more than 20 minutes, followed by a rest period before study is resumed. As the learner develops physically and mentally, the length of the study period can be increased to 30 minutes or longer. However, it is unhealthful and non-productive of best study results for even a college student to "bury himself in books" for hours at a time just prior to an examination.

Application of general rules of study. The pupil is the person to know and to use good rules of study. The teacher, however, is the person who needs to be well acquainted with the functioning of study rules in order that he may give proper guidance in study practices. In 1929 Cuff investigated the study habits of elementary and secondary school pupils. A list of seventy-five rules was given pupils on which to check their

TABLE XI.   *The Ten Rules for Study Most Frequently Listed in 500 Contributions*

RANK	RULE	PERCENTAGE OF STUDIES EMPHASIZING RULE
1	Have a definite time for study of specific lessons	94
2	Get lessons alone	83
3	Take notes on lectures	72
4	Ignore distractions	66
5	Skim over material before reading it in detail	55
6	Work out individual examples to illustrate general rules and principles	52
7	Seek a favorable environment for study	50
8	Have a clear notion of the task before beginning	48
9	Review previous work before beginning an advanced assignment	47
10	Recite silently immediately after reading a lesson	42

From N. B. Cuff, "Study Habits in Grades IV–XII, *Journal of Educational Psychology*, 28:295–301 (1937).

study practices. The study included the responses made by learners of differing scholarship, intelligence, and chronological age. In Table XI are listed the ten rules for study most frequently listed in 500 contributions.[11] The results of this investigation of the study habits of young people appear to show that slower pupils are not able to understand the work, use facts, and grasp meanings as readily as are more able pupils.

STUDY HABITS THAT CONTRIBUTE TO THE EFFICIENCY OF LEARNING

Many pupils are able to develop efficient study habits without receiving any special formal training. However, these satisfactory habits may result from the use of several methods of study before satisfactory study procedures are discovered. Some pupils fail to achieve economical and successful study techniques unless they receive help in the form of guiding principles which they can apply to their study activities. The following suggestions are based upon psychological factors underlying learning and have practical value as aids in the development of habits of effective study.

1. Have a definite purpose for study.
2. Have a definite place for study.
3. Seek physical conditions that are favorable to concentrated mental activity.
4. Plan and follow a definite time schedule for study.
5. Intersperse study with rest periods.
6. Look for the topic sentences of paragraphs.
7. During study use the method of silent recitation.
8. Employ the "whole" method of studying whenever possible.
9. Make an effort to read rapidly and carefully.
10. Take brief well-organized notes.
11. Try to evaluate the difficulty of the material to be learned.
12. Raise significant questions and attempt to find answers
13. Study with intent to recall.
14. Study carefully charts, graphs, and other illustrative material.
15. Develop the habit of summarizing and reviewing.
16. Make sure to complete the study assignment.
17. Reflect on statements made by authors and challenge them when in doubt.

[11] N. B. Cuff, "Study Habits in Grades IV–XII," *Journal of Educational Psychology,* 28:295–301 (1937).

18. Investigate the points of view of several authorities.
19. Be alert to instances in which the subject matter learned in one course may apply to the subject matter in another.
20. Learn to use the dictionary properly.
21. Analyze study habits and attempt to correct weaknesses.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Plan your evenings hour by hour after 6 P.M. for two weeks. Continue and vary the plan until it meets your needs.
2. How many distracting noises are there in the place you study?
3. To what extent do your study habits follow the suggestions presented in this chapter?
4. Why is it advisable to give attention to the points made by the teacher?
5. To what extent do you use the "whole" method in study? Why is it so difficult to apply?
6. Why should you be able to read some material more rapidly than other?
7. What is the value of being neat and orderly in note-making?
8. What are the values of the recitation method in study?
9. Compare the value of learning a whole unit at one sitting with that of distributing the time for learning.
10. What is to be gained by cramming? What lost?
11. Check the way you spend your time against the activities reported in the Birds' study on page 276.
12. Write a five-paragraph summary of this chapter.
13. Why is attitude so important in study?
14. What are the most distracting influences that you experience in study?
15. Report an instance in which you were too tired to study but had plenty of energy to attend a dance or other function.
16. How is the ability to concentrate related to effectiveness in study?

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ACQUIRING MOTOR SKILLS AND KNOWLEDGE

The functioning of an individual's sensory mechanisms and his acquiring of perceptions are basic to the learning of motor skills or the mastery of knowledge content. Consequently, it would seem desirable to consider the development of perception before entering into a discussion of motor learning. However, motor activity begins so early in the individual's life and is so closely allied to the development of percepts that motor learning will be considered first and percepts will be associated more directly with the acquisition of meaning as this is gained through the functioning of the higher mental processes. It must be understood, though, that motor learning would be impossible without the ability to acquire sensations and perceptions. Muscular activity of any kind consists of responses to external or internal stimuli. The more proficient the motor skill is to become, the greater need there will be for accurate perception of sensory stimuli as the skill is developed.

THE DEVELOPMENT OF MOTOR SKILLS

Value of motor activity. The skills that involve bodily movement are as important to an individual in meeting life demands as is the mastery of abstract ideas. All individuals acquire many motor skills that serve them in their day-by-day living. Walking, for example, is a motor skill that becomes habituated through many trials, as the child achieves body balance.
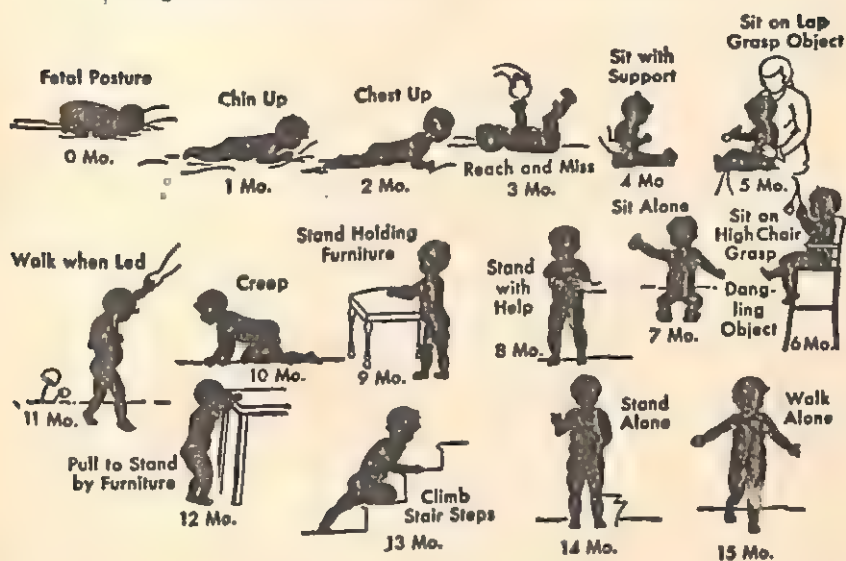
FIGURE 18. *The Motor Sequence*

From Mary Shirley, *The First Two Years*, Vol. II, frontispiece. Copyright, 1933, by University of Minnesota Press.

Each individual has his characteristic way of walking, so much so that he can be identified by his audible step alone. An individual uses his left or his right hand in the performance of certain simple activities, such as holding a spoon. The habits he has formed result from practices since his early days. However, he spends many hours, days, weeks, or even years in planned practice toward the perfection of those motor responses or skills through the performance of which he is enabled to exist or to achieve desired social recognition or economic superiority. Many of the more common motor skills are acquired incidentally, but the school is including an increasing number of so-called vocational subjects requiring motor skills.

Early motor development. Motor control begins in the region of the head of an infant. He first gains in control in holding his head erect and fixating his eyes. Then he develops precision in reaching for and grasping objects that interest him. Posture, however, is delayed. It begins posteriorly and develops until the child can sit erect, crawl, stand, and eventually walk. These activities eventuate in posture.[1] (See Figure 18.)

[1] See M. Shirley, *The First Two Years*, Vol. II. University of Minnesota Press, 1933.

Muscular responses are closely related to sensory stimulation. For example, in experiments at the Leningrad Institute it was found that sensations of posture produced in an infant by his being held on the knee of a male (with the baby's face covered to eliminate visual stimulus effect) stimulated the baby's mouth to respond in movements of nursing.[2]

Provision should be made for the practice of gross bodily movements from young childhood onward. Any interference with the early forms that these movements take may hinder motor learning. Each infant develops his own particular crawling pattern.[3] One child crawls with his buttocks on the floor, another combines a crawl and a roll, and a third may push himself backwards. (See Figure 19.) A child may develop so great a degree of proficiency in a particular method of crawling that occasionally he prefers it to attempting to walk, even after he has learned to take steps. The habituated locomotion may seem to get him where he wants to go more quickly than the still relatively unformed walking method. Since parents usually encourage the child to walk, he gradually shifts from crawling to walking. The child who creeps at an early age is likely also to learn to walk at an early age. Later the child gives expression to his energies by engaging constantly (with practiced controls) in running, climbing, rolling, throwing, and other gross bodily movements.

Later motor development. The value to the individual of motor learning comes in the success with which he can develop to automatic habit level the motor responses or skills that will make him proficient in any learning area. Essential to the development of motor skill are long periods of practice during which errors are eliminated from the habits that are being established, accompanied by the desire to succeed and confidence that success will be assured.

An increasing amount of school time is being devoted to motor learning. Penmanship, drawing, typewriting, laboratory experimentation, shopwork, cooking and sewing, and the various activities that accompany aspects of the so-called activity program (pounding nails, sawing boards, and building projects) — all

[2] See M. Curti, *Child Psychology*, pp. 141–143. Longmans, Green, and Company, New York, 1930.

[3] See M. B. McGraw, *Growth: A Study of Johnny and Jimmy*. D. Appleton-Century Company, New York, 1935.

FIGURE 19. *Postural Phases in Development of Crawling and Creeping*

1. Newborn crawling movement. 2. Less activity in lower extremities; begins to hold head up. 3. Increases control over movements of head and shoulder girdle. 4. Marked development in upper part of body; pelvis rests on the surface. 5. Conflict in action of pelvic and shoulder regions; when pelvis is raised, head and shoulders are lowered. 6. Rocking movements; maintains abdomen above surface. 7. Associated creeping movements.

require motor control. Also, the present emphasis upon physical and health education demands the acquiring of proficiency in playing games and in using gymnasium equipment.

Factors involved in motor learning. The aim of motor learning is to develop proficiency in whatever skill is being learned. The simpler skills are mastered by utilizing movements already learned and combining these in a workable pattern. For example, the development of motor skills involved in driving a car, playing in a marching band, or riding a bicycle demands motor coordinations or motor responses that in part have been learned earlier. After the skill has been perfected to the point that the individual shows proficiency in it, he then is considered to have *form* in the skill.

The form that is acceptable is the one that corresponds as nearly as possible in bodily adjustments, posture, and ways of handling materials with that used by a successful performer in the skill activity. When a baseball batter stands at the plate and swings his bat as does a successful batter, the former is said to have good batting form. In his efforts to develop a skill to a high degree of perfection the learner must realize that his earlier habit patterns play an important part in the development of the new skill. These patterns, however, sometimes interfere with his attempt to imitate the form of another skilled person who serves as his model. The learner will always remain an individual, and he should be allowed the freedom necessary to develop his own skill pattern. It must not be forgotten that Al Simmons, who earned the best batting average in the American League in 1931, took the wrong stance at the plate, from the point of view of baseball experts.

In attempting to guide a learner toward the development of skill in any special area, a teacher should:

1. Know the methods that have been successful.
2. Encourage learners to practice those techniques that are known to be effective.
3. Keep discouraging criticism to a minimum.
4. Emphasize correct movements.
5. Insist upon speed and accuracy for efficiency.
6. Stimulate practice and more practice under favorable conditions.

(1) *Knowledge of effective methods.* The teacher who knows what to do and how to do it thereby establishes confidence in himself on the part of his learners that helps toward the arousal in them of strong mind sets or determinations toward mastery of the skill according to techniques and procedures suggested by him. The right suggestion given in the correct manner at the right time can do much to start motor learning in such way that fewer errors will need to be eliminated later.

(2) *The practice of proved techniques.* The individual learner who is mentally ready to attempt to master the techniques that have been found to be successful by others probably will discover that his first or even his tenth attempt may seem to be unsuccessful. Certain motor coordinations need to be established before the learner achieves success in the use of refined techniques. The teacher can help him from becoming discouraged during the early and clumsy stages. The learner may have to pass through a practice period in which neither he nor anyone else can perceive marked improvement.

, In most cases of motor learning, or of any other form of learning, an individual tends to exhibit a degree of relatively rapid improvement in the early mastery of the elements of the skill (called the initial spurt). Then, as he attempts to refine his techniques during successive practice trials, he may seem for a time to be making little if any observable progress. This period of practice during which little observable progress is noted is referred to as a plateau in learning. However, the learner is achieving facility through inner adjustments that may not show themselves in his observable behavior but that later show the results in improved performance. From this point on, with some slight variations in success he usually continues to improve until he reaches his final degree of competence. Figure 20, representing improvement in the practice of telegraphy, illustrates the direction that may be taken in motor as well as more abstract forms of learning.

Improved conditions of learning that lessen or remove certain physiological factors (such as fatigue or eyestrain) interfering with gainful practice, and sounder methods of presenting the steps to be followed in the acquiring of the skill, better organization of practice, and other contributing factors are effective in eliminating or modifying extended plateaus in learning curves.
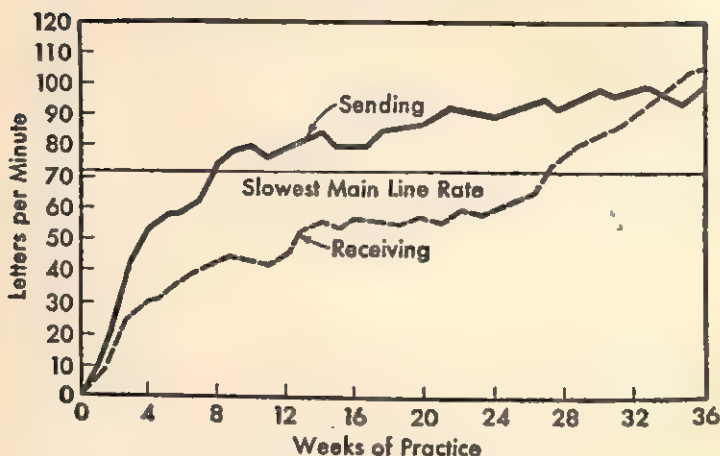
FIGURE 20. *Improvement in Telegraphy*

The upper curve shows results for transmitting messages; lower, the rate of receiving. Just above the word "receiving," the plateau extends over a period of nearly ten weeks, followed by a rapid rise. Line marked "slowest main line rate" indicates slowest rate at which commercial messages are sent.

From D. Starch, *Educational Psychology*, p. 156. Copyright, 1919 and 1927 by The Macmillan Company and used with their permission. (After Bryan and Harter.)

Learning procedures are increasingly being adapted to learning needs. Improvement in practice conditions and techniques is resulting in greater economy of learning in many skill areas.

(3) *The avoidance of adverse criticism.* During the beginning stages of practice gross errors only should be corrected. It is too much to expect fineness of response during early repetitions. At first an individual's movements are likely to be hesitant and awkward. As practice proceeds, the useless and clumsy movements are eliminated. The instructor who emphasizes the making of correct responses step by step builds confidence in the learner that serves as a tonic to further practice.

(4) *Speed and accuracy for efficiency.* A trained worker does more work with less effort than does an untrained worker. The champion skater does not consider the possibility of losing his balance. The experienced bicycle rider pedals at any angle without fear of falling. The trained typist writes more rapidly and with fewer mistakes than does the ordinary typist, since the former is not trying to avoid errors. In short, the skilled person relies with confidence upon those automatic habits that have served him in the past. In the development of a high degree of proficiency accurate performance is of prime importance but as

much speed as is consistent with accuracy should be the goal during learning. In general, accuracy should not be sacrificed for speed. Many of our skilled workers do not excel in speed, but their work is accurate and proficient.

It has been found helpful for a beginner to try to complete the motor pattern regardless of the errors that he may make. As practice continues minor errors tend to be eliminated. The complete pattern should be practiced as a continuity until definite progress has been made. During the advanced stages of practice it is desirable to pick out certain weaknesses of performance and to give concentrated practice to them.

It is essential that many motor skills become automatic and relatively independent of the higher mental processes. When this is accomplished the individual is enabled to direct his attention to other aspects of the situation. The person who already has developed a skill to a high degree of efficiency is free to concentrate on those factors in the situation which operate as variables as he attempts to emulate the achievement of proficient workers in the field. The automobile driver must attend to other elements in the situation than the manipulation of the machine; the speaker responds to his audience; and the baseball batter keeps his eyes on the pitcher. The skilled worker has full control of his mental as well as motor responses.

(5) *Need of consistent practice.* The effectiveness of practice depends upon more than mere repetition. Consistent practice is all important, but the results of practice are affected by numerous factors, among the more important of which can be included:

1. The nature of the skill to be learned.
2. The age and special interests of the learner.
3. The conditions under which the practice is conducted.
4. The amount of time available for practice.
5. The spacing of the practice periods.
6. The degree of proficiency desired.

It is important that the learner practice the skill in the way in which it is to be used later and under similar conditions. One learns what he practices. The learner should have a clear idea of what the perfected skill is that he is attempting to develop and direct his practice accordingly. For example, training in penmanship by using a pen that must be dipped after every few

movements is not the best kind of practice for the individual who probably will use a fountain pen during the rest of his life. Similarly, the learner in a workshop should use real tools and real material, in so far as this is possible, and make real things that have practical significance.

One method of teaching typewriting, for example, is that of training the learners to type sentences as soon as the keyboard has been learned. This technique stimulates the learner to produce meaningful material and helps him to recognize and to be concerned about his mistakes. Above all it builds correct sets of motor habits for the respective words typed.

When a learner knows the goal toward which he is aiming and keeps that goal in mind as he practices, better results can be expected. The interest of the learner in further improvement must be maintained throughout the practice period. As soon as the learner is satisfied with his degree of achievement, further progress is likely to cease.

It is the function of the teacher to help the learner to realize the degree of efficiency that he should attain. The limit of achievement will vary according to an individual learner's ability to achieve. The time needed to reach respective levels of proficiency also varies with individuals. The quick learner should not be retarded in his further possible mastery of a skill by the practice needs of less able learners in his group. Rate of learning and degree of skill to be attained should be adjusted to the abilities and interests of individual learners.

The length of practice periods and their spacing depend upon the type of skill to be mastered and the age and ability of the learner. Proficiency in simple motor activities can be achieved through participation in relatively short practice periods once or twice a day until competence is acquired. The practice periods of young children should be shorter than those engaged in by older children, adolescents, or adults. Between the periods of practice for any individual of whatever age certain inner co-ordinations may take place as a result of previous practice and show themselves in the next practice period.

Although practice periods should not be so long that elements of physical fatigue or boredom enter into the situation, there also is danger in making these periods so short that nothing is accomplished during them. Before scientific studies, such as

those conducted by Book, indicated the value of time and spaced practice periods, it was not unusual for a group of learners (even young children) to be kept at the practice of a skill for an hour or more at a time. With the educational emphasis upon the waste of long periods of practice the pendulum swung to the other extreme. It was possible to find a daily class schedule in the lower grades of the elementary school divided into three- to five-minute periods with few ten-minute or longer periods in between. As a result, the children were kept in what might be termed a constant state of confusion. Fortunately, such situations are not now common. In general, most learning situations reflect optimal length and spacing of practice periods in accordance with the demands of the skill itself and the interest of the learner. In the beginning stages of skill mastery, practice periods probably should be relatively short and well spaced. However, as the learner approaches a high degree of proficiency in the skill, he may be motivated by his intense interest in perfecting it to extend the length and number of the practice periods. For example, in the early stages of learning to play the piano, a thirty-minute practice period once a day might be satisfactory. However, many a virtuoso has been known to spend many hours in the perfection of one series of finger movements.

Curves of learning plotted in terms of the acquisition of motor skills exhibit differences in acceleration that are related to the relative simplicity or difficulty of the skill to be mastered. Kreuger conducted an experiment that dealt with the tossing of Mason jar rings one at a time so that the rubber rings would fall upon and remain hanging on a nail in a wall four feet above the floor. As a result of the experiment Kreuger concluded that the learning curve of eighty participants (undergraduate college students) seemed to indicate the following trends:

When the task assigned is very simple, we may expect a negatively accelerated curve of learning. When the requirement is rather difficult for the learner, the consequent progress will follow a pattern of positive acceleration. As the task shifts from one that is relatively easy for the learner to one that is relatively difficult, corresponding rate of learning will shift from negative to positive acceleration.[4]

PERCEPTUAL LEARNING

Relation of sensation to perception. It is through the functioning of his sense organs that an individual is enabled to learn about himself and the world in which he lives. The sense organs serve as means of building a mental life. As the sense organs are stimulated and as they discriminate among the multiple stimuli by which they can be affected, learning is made possible.

Since the respective sense organs are selective in that they are sensitive to particular forms of stimulation, intelligent adaptations to environmental factors are made possible. Only confusion would arise if, for example, the eyes could be stimulated by both sound and light waves. There are, however, many forces or objects in the environment to which sense organs do not respond unless the latter are sensitized or the stimulating forces or objects are magnified or intensified. Mechanical aids are used to up-step air waves or ether waves which, without the use of artificial aids, might fail to arouse the sense organ. The microscope is used to bring small objects or minute living organisms into the realm of sensory stimulation.

An individual's first reactions to his environment by way of the activity of his various sense organs are considered to be unlearned responses to stimulation and are called *sensations*. As the child continues to grow, his sensations are associated with one another, and thus meanings are attached to them. For example, the sound of the word "Daddy" becomes connected with the sight of the father, thereby giving meaning to the term to the child. As the sense organs continue their functioning, more and more sense impulses are associated in the central nervous system with those already received and meanings are developing. This process results in meaningful sensations or *perception*.

For adequate perception, the sense organs must be receptive to the stimuli in the environment. The more sensitive to stimuli an individual's sense organs are the more discriminative is he likely to be in his understanding of differences in meaning. Not only must the sense organs function adequately, but correct meanings must be attached to sensations if false perceptions are to be avoided.

The parent and the teacher are concerned with the formation by the child of correct perceptions. A percept is a meaningful

sensation. Since a percept has its basis in sensation, it becomes necessary to provide actual or vicarious experiences that present correct sensory material. These in turn must be interpreted realistically in order that the higher forms of associative learning may be directed toward ideas basic to successful living. An inadequate or incorrectly interpreted sensation will produce a vague or false percept.

The percepts of a very young child are simple. With the addition of continuing experience these percepts take on more and more new meanings. For example, if an infant is shown an object, say an orange, he receives visual sensations of its size, color, and shape. Later he may be permitted to touch and roll it as he hears others call it an *orange*. At first the connection between the orange itself and its name may be false. A young child may watch his mother prepare his orange juice while she says to him, "Baby is going to have his orange juice." He drinks his orange juice and likes it; hence his auditory perception of the orange is *orange juice*.

As the child enlarges his experiences with an orange he also will enlarge his understanding of an orange and its significance as a kind of fruit. The meanings that are given to sensations arising from stimulation of sense organs by the orange are a part of the perceptions of *orange*. Mental development is concerned with the experiencing of new percepts and the utilization of percepts already learned. The interpretation of experiences soon becomes as important as the sensory experience itself.

Unless an individual is asleep or absorbed in thought he is perceiving one thing or another. There is a running together of the perceptual experiences that go on continuously. If attention is focused on the state of the weather, the passing automobile, the sound of the radio, or the smell of frying meat, for example, each will result in its own perception. Or as an individual attends to a particular object he may experience numerous perceptions — a watch may be perceived as a shiny object, an object that makes a noise, a circular object, a small object, or a timepiece. This multitude of percepts gives richness of meaning, and the effect is cumulative, since as percept is added to percept, meaning is enlarged.

Perception is influenced by both present and past experience and also is affected by an individual's attitude at the mo-

ment. The perception of a given object — an airplane — varies with individuals beeause of their different interests and different experience backgrounds with airplanes. The businessman might perceive the airplane as a rapid means of travel. The mechanic might perceive it as an opportunity for a job. The person who fears flying might regard it as an instrument of death.

Factors such as the physical state of the sense organ, interest, past experience, degree of attention, and amount and kind of stimulation influence the extent and quality of perception. Percepts of a specific situation are obtained in light of (1) the individual's previous training and experience, (2) the specific stimuli that arouse sense organs at the time (details attended to), and (3) the interpretation that is given to them.

Usually percepts first include general outlines. The details are filled in later. As an individual looks at a lamp, a house, or a horse he attends to enough details in the general outline to satisfy himself that the object is a lamp, a house, or a horse. Later, attention shifts from one detail to another until many additional details are observed and the individual is able to describe the object not only as a house, for instance, but as a particular kind of house. Observe a person who is walking toward you down the street. The first impression is that the person is a man or a woman. As detail after detail is added in the observation he becomes a particular person of a certain height and weight, dressed according to a certain style, and having a characteristic gait.

There are many details in an individual's environment to which he does not respond as he percieves. He is satisfied with the general outline and takes the details for granted. He can read a sentence containing a misspelled word and not detect it. However, persons who are especially sensitive to correct spelling are quick to discover the error. In an earlier book written by the authors, they purposely misspelled a word. A person who read the manuscript of the book critically made the following comment: "There is no misspelled word on this page as reported by the authors." The typesetter, on the contrary, detected the error and set the type according to the correct spelling. (Did you respond to the misspelled word in this paragraph?)

Illusions and perceptions. Faulty perceptiolis are called *illusions*. The errors may result from inadequate stimulation,

poorly functioning sense organs, or incorrect interpretation of the sensation or sensations. Illusions are experienced especially easily during motion (of either the individual or the object perceived). Great distance from the object or comparisons of objects separated in time or space may lead to illusions. For example, if you are seated in a train that has stopped at a station and you look at a train on another track that has started to move, you get the illusion that your train is moving. Your own mental set (a desire to get started) may be a factor in your false interpretation of the actual fact. Again, railroad tracks appear to be closer together at a distance from where you are standing than they are in your immediate vicinity. Fence pickets seem to disappear if you drive past them at a rapid rate. Spokes of wheels appear to rotate backwards if they are observed through a picket fence. An average-sized man appears to be taller in a group of short men than in a group of tall men. In each of these examples the actual facts are known or can be checked, but the perceptions do not correspond with the facts and hence are illusions.

Early perceptual development. Shortly after birth an infant shows signs of increasing sensitivity to stimuli. In fact, it is believed that a high degree of sensory acuity is attained within a few months after birth. Even though the newborn infant is unable to focus his eyes at birth, he gradually perceives objects, hears sounds, and becomes conditioned to certain stimuli in his environment. In studies of the reactions of young children it is difficult to obtain measurements of these perceptions since the tester cannot be sure of the nature of the response. Progress continues, nevertheless, and by the age of three the child has progressed far toward his maximum of sensory acuity.[5] He also has made excellent progress toward building meaning into his experiences — he is gaining usable perceptions.

The infant focuses on moving objects. He chews his rubber ring and shakes his rattle. He gradually learns to respond to stimuli in specific ways. When the stimuli please him he seeks continued stimulation; when he dislikes the stimuli he tries to avoid them. He watches a moving foot, responds to a smile, or enjoys the feeling of pounding his dish with his spoon. Thus perceptions are being built and his environment is becoming

[5] See H. L. Kingsley and R. Garry, *The Nature and Conditions of Learning*, Second Edition, Chapter 11. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1957.

differentiated to him. He also soon learns the extent of the interest or use to him of objects in his environment. He observes that some objects move, some make sounds, others can be eaten, still others give off light. He begins to perceive each in relationship to its function and as different from the others.

Later perceptual development. Accuracy of perception increases as the learner adds to his experiences and as his sense organs are developed to their maximum acuity. Attention to details for accurate recognition or correct perception decreases as one becomes better acquainted with the object. For example, a person well known to an observer may be identified correctly by the latter as the result of a mere glance at the back of his head or a hearing of the sound of his voice. However, the observer may need to have a complete front view and even a short conversation with a person whom he knows only slightly in order to recognize him.

Mental set or an attitude of expecting an object or situation to be what one thinks it should be is important in perception. A child who desires ice cream may believe that some cottage cheese which he sees is ice cream until he tastes it. At night, a small puddle of water may appear to be a stone until the person tries to step on it. A glass of alcohol may appear to be a glass of water until an individual begins to drink it. Except as stimuli are misinterpreted, adequate perceptions are made by most developing learners who have normal or near normal sense organs. However, as indicated above, attitude at the moment or mental set may influence actual perceptual formation.

It was suggested earlier that some percepts are arrived at with relative ease and accuracy. The size, shape, color, and taste of an orange present no difficulties to the perceiver. However, an accurate perception of the speed of moving objects, the size of distant objects, or the actual distance of an object from the individual is not a simple response but requires long experience and careful training if the perception is to possess any high degree of accuracy. Each individual judges the distance of objects from him or the size of objects in terms of his experiences in his own locality. In another locality the air may be less filled with clouds or dirt so that he needs to reorient himself in order to correct his possible error of perception of either distance or size.

We can experience space. That is, we can obtain perceptions of space. It is believed that space is experienced as a blend of sensations — of color-muscle, sound-muscle, and touch-muscle. Space is all about us, yet experience with it varies with the time of the day, the condition of the weather, and other factors. Distance in Arizona is judged differently by visitors from New York or Boston than by those who live in Phoenix. Airplane pilots are aware of these differences and must make allowance for them as they fly from place to place.

Test yourself on your ability to perceive the duration of *one* minute. Practice the perception and discover what you do to improve. Try to judge the speed of a moving automobile while you are riding in it. Try this again as you are standing on the road watching the car go by. What are the difficulties involved? When you are in an airplane riding at 10,000 feet above the earth's surface, a mile appears to be about the length of a city block. Ability to perceive distance is one of the important needs of pilots. They must know that variations depend upon the topography of the land as well as the atmospheric conditions.

Perception of the once blind. Earlier it was stated that it is difficult to determine the perceptual experiences of young children since it was impossible to obtain from them a report of their actual experiences as they were gaining their early perceptions. It is through the experiences of those who were born blind but who later were enabled to see as a result of eye surgery that we can obtain information concerning the building of percepts. The once blind individual has a background of knowledge about objects obtained through other sensory stimulations. Now he needs to learn anew the perceptions that accompany sight, such as colors, shapes, and shadows.

Cases are on record of individuals who were sighted or partially sighted for a brief period of life and then became blind. Their perceptual images are likely to be more nearly like those of sighted individuals. For those individuals who were blind or nearly blind at birth and who at a later date, such as during their late teen years, become sighted perceptions are inadequate and need to be formed anew.

Their need for correction of perception is somewhat similar to that of a child who has learned about snow only from pictures or from talk about it. His first actual experience with snow gives

him a completely new visual perception of it. Likewise, since perception of distance depends on the synchronized functioning of several senses, the once blind at first may misjudge it. Formerly, he relied upon sound and muscular sensations; now sight can increase his accuracy of distance perception.[6]

The teaching of percepts. In order that correct and adequate percepts can be learned, the learner must be provided with first-hand experience in as many learning situations as possible. Visits to schools, factories, offices, farms, homes, coal mines, railroads; happenings on the next block; motion pictures to supplement still pictures; television to supplement field trips; laboratory experimentation to supplement other direct observation of sketches, charts and drawings, and models — all contribute to perceptual learning. Learners often need to be helped to know what to look for. The teacher guides the observation so that perception is as accurate and as complete as possible.

The teacher should be concerned also with the health conditions of the learners. All difficulties of sight and hearing should be corrected as far as it is possible to do so. Seating arrangements in a classroom should take into consideration not only the pupil's acuity of hearing and vision but also other physical conditions, such as height, weight, or crippled state.

It is not enough merely to expose learners to external stimuli in the environment through actual objects or visual or auditory aids. Learners need to react to sensory stimuli actively in order to continue the mental processes which eventuate in reflective and creative thinking. The vague and inadequate percepts acquired by the passive individual are not likely to serve him well in the exercise of higher mental processes. The teacher needs to stimulate the learner toward a synthesis of his percepts into usable patterns.

THE DEVELOPMENT OF MEANING

The nature of meaning. Meanings are dependent upon words that serve as symbols of first-hand experiences. These symbols (words) that have common meanings are useful in learning in that they provide a uniformity of expression to the

[6] See E. R. Hilgard, *Introduction to Psychology*, Second Edition. Copyright, 1957, by Harcourt, Brace and Company.

extent that they represent the language patterns of a group, such as English-speaking peoples. Words both symbolize and express relationships in experience, and become the means through which ideas flow.

To each experience we try to attach a meaning. The acts of another person are evaluated — What do they mean? The words of another are considered — What did he mean? A person's behavior is aggressive — What is meant by it? We drive an automobile and we meet a red light — What does it mean? We have learned that a red light means to stop. But we meet an amber light — What does that mean? It may mean one thing in one locality and another in another locality. And so it continues — we learn to ascribe definite meanings to certain symbols or characters. For example, "Roger" means something very definite to a pilot, but it is merely a name to many other persons.

A child's experience is enlarged as he reacts to the detailed aspects of objects. His perception is refined as he discriminates between the elements of situations. According to Dewey:

> The acquisition of definiteness and of consistency of meanings is derived primarily from practical activities. By rolling an object, the child makes its roundness appreciable; by bouncing it, he singles out its elasticity; by lifting it, he makes weight its conspicuous distinctive factor. Not through the senses, but by means of the reaction, the responsive adjustment, is an impression given a character marked off from qualities that call out unlike reactions.[7]

Thus, through multiple percepts and inner adjustments the child arrives at his own meaning of words that he hears or of experiences that he gains directly. He builds meanings into each object or situation with which he is confronted and usually reports what it is used for rather than how it looks. Enlarging experience with objects results in changed meanings. The child needs opportunities to recognize and to manipulate the objects with which he is provided.

Correct names for objects should be used so that the child gets these basic meanings. A significant problem of sex education in the home is caused by the fact that parents use substitute names (words) instead of the correct words for body parts and

[7] From J. Dewey, *How We Think*, p. 142. Copyright, 1933, by D. C. Heath and Company.

functions. Learning becomes more effective as more words are brought into use by the individual and finer discriminations are made among those that are in daily use. It is as fascinating to be in the presence of individuals who exhibit clearness of meaning in their speech as it is to watch persons displaying expertness in skill of one form or another — a sport, music, wood-carving, dancing, and the like.

Words are real situations even though they are abstractions. They are symbols that either may be repeated by rote without understanding or may be used with meaning that is familiar to all persons concerned. It is possible, however, that words may mean one thing to one person and something else to another. "Freedom of speech" may mean one thing to one group and may be interpreted very differently by another group.

As words are used in sentences an individual is helped to think abstractly about things that are not present to the senses as well as to communicate ideas to other persons. In reading, the meaning derived from the words that are read is the reflection of the experience of the individual in relationship to the words read. Horn, who made a careful study of the problem of meaning, suggests:

For the words of the printed page, as has been pointed out, are wholly symbolic. Only insofar as they are related to the experience of the reader can they either convey correct ideas or stimulate their construction. Unless so related, even statements of the simplest and most concrete matters are unintelligible. . . . For example, the sentence, "He lost his way in a blizzard," must of necessity have limited meaning for one who has spent his whole life in Florida.[8]

Meaning difficulty is increased when ideas rather than objects are dealt with. "A mental function," for example, is an abstraction that deals with ideas alone and will mean to the reader whatever its component parts mean. The English language is full of words that have many meanings. This results in confusion not only among non-English-speaking people but among English-speaking people as well. Words such as hide, skate, run, and light need the context of the sentence in order to clarify the meaning. For example,

[8] From E. Horn, *Methods of Instruction in the Social Studies*, p. 177. Copyright, 1937, by Charles Scribner's Sons.

The hide of the cow.
The boy wants to skate.
The train runs on a track.
Bees light on honeysuckle bushes.

The boy wants to hide.
He is a good skate.
He expects to run for congress.
The light is on.

This does not mean, however, that context alone always can give the meaning. It is usually necessary to have some knowledge of the word in order that the context can complete the meaning or at least assist the reader to select out of his experiences with the word that meaning which is properly associated with it.

Comprehension of ideas can be improved by simplifying the vocabulary used. However, it may be possible to oversimplify the vocabulary. Several years ago an attempt was made to present a system of *Basic English* for the purpose of making English easier for world usage. The 850 words included were selected carefully and a simple set of rules was devised for putting them together into usable English. Traditionally set patterns of communication are strong, however, so that simplified vocabulary like simplified spelling is not accepted easily or quickly.

In the final analysis, when complete meaning is incorporated into a word or derived from it, the individual has an idea about it, a concept of it, or a generalization about it. Ideas are generalizations that result from experiences which have been interrelated and organized as functional mental processes. Generalization is an active process and is a complex form of behavior. It will be discussed more fully in the next chapter.

MEMORIZING

Importance of memorizing. The securing of a clear image at the time of sense stimulation is important, but it is equally important that a mental image resulting from the percept be recalled later if the individual so desires. It is annoying to realize that you have had an experience which at the moment you are unable to bring to the level of conscious recall. Without this power of conscious recall or *memory* an individual's powers of achievement would be almost nil.

It is difficult to recall something that you never have understood or that you never have really learned. Memory functions as ideas are learned, retained, recalled, and recognized. Asso-

ciating ideas with other ideas that have been thoroughly learned is an effective way of remembering the newer ideas. Through the ability to associate ideas, we pass from the perception of an object to ideas associated with it in our experience.

Memorizing is important to the extent that it provides useful material for thinking. The better thinker is the person who has learned to remember his experiences. A single experience may be remembered because of its significance, its simplicity, or its interest-arousing elements. One reading of a poem, however, probably is not sufficient to enable most individuals to repeat it. Several readings will be required before the poem can be repeated verbatim. Similarly, more than a single reading will be needed to reproduce the following: 97–46–82–51–84–27–29–63–15–38.

Overlearning. Whenever learning takes place to the point that the material can be recalled, the material is considered to have been learned. Facts that are to be used in further learning need to be learned beyond the point of recall. Our habits of language are overlearned and are established early in life. It is well, then, to learn correctly those things that are to be used again and again. Addition and multiplication combinations and the spelling of words, for example, are so valuable in everyday life that overlearning to the point of automatic response is desirable. To give back without hesitation or after a lapse of time, or to evaluate the content of study material requires overlearning. Recall is made easier when ideas are repeated or rethought. Many learners rely upon only one reading of study content, believing that they understand what they have read. What they do not realize is that it is one thing to understand but another to recall.

Value of whole and part methods. Whole learning is a relative term. The size of the unit should be considered. A whole might constitute a book, a chapter in a book, a paragraph, a poem, or a list of words or numbers. The whole certainly should not go beyond the comprehension range of the learner.

Experimental evidence has revealed that if a poem is not too long the whole method is preferable to the method of learning the poem line by line until the entire selection can be repeated from memory. When a selection is read as a whole (from beginning to end), the reader can react to the meaning of the entire

selection. An entire reading acquaints the learner with all the ideas. When the whole selection is repeated again and again, mastery is likely to be more complete than when it is memorized part by part.

The whole method is most economical when the material contains one general thought to which the remainder of the selection is related.[9] However, even when there is meaningful and logically related material, it may be desirable to combine the whole and part methods. The part method usually is more effective in the learning of material of unequal difficulty. Experimental evidence is not conclusive on the question, partly because the whole method and the part method have not been defined clearly nor used in the same way by all experimenters. Pyle and Snyder, in a study of whole versus piecemeal learning of poetry, found the whole method more efficient,[10] while Reed's study of whole versus part method shows very little difference between the two.[11]

Although there seems to be some confusion among experimental results, most psychologists seem to favor the whole method over the part method. The chief advantage of the whole method is that it makes it possible for the learner to perceive interrelationships among ideas and to follow them in their logical sequence. Thus, in the learning of a poem the general theme is emphasized by the whole method but may be lost in the part method.

A rapid reader is better able than a slow reader to utilize the whole method. Difficulty of material also is an important factor in the successful use of the whole method. If the material is difficult for the experience level of the individual or if his ability is low, the part method is likely to be more effective. With increase in comprehension goes increase in value of the whole method.

Forgetting. Unfortunately, after learning has been completed, forgetting sets in. However, the more complete and satisfactory the learning the less rapid the forgetting is likely to be. To know

[9] See K. C. Garrison and J. S. Gray, *Educational Psychology*, pp. 242, 289. Appleton-Century-Crofts, New York, 1955.

[10] W. H. Pyle and J. C. Snyder, "The Most Economical Unit for Committing to Memory," *Journal of Educational Psychology*, 2:133–142 (1911).

[11] H. B. Reed, "Part and Whole Methods of Learning," *Journal of Educational Psychology*, 15:107–115 (1924).
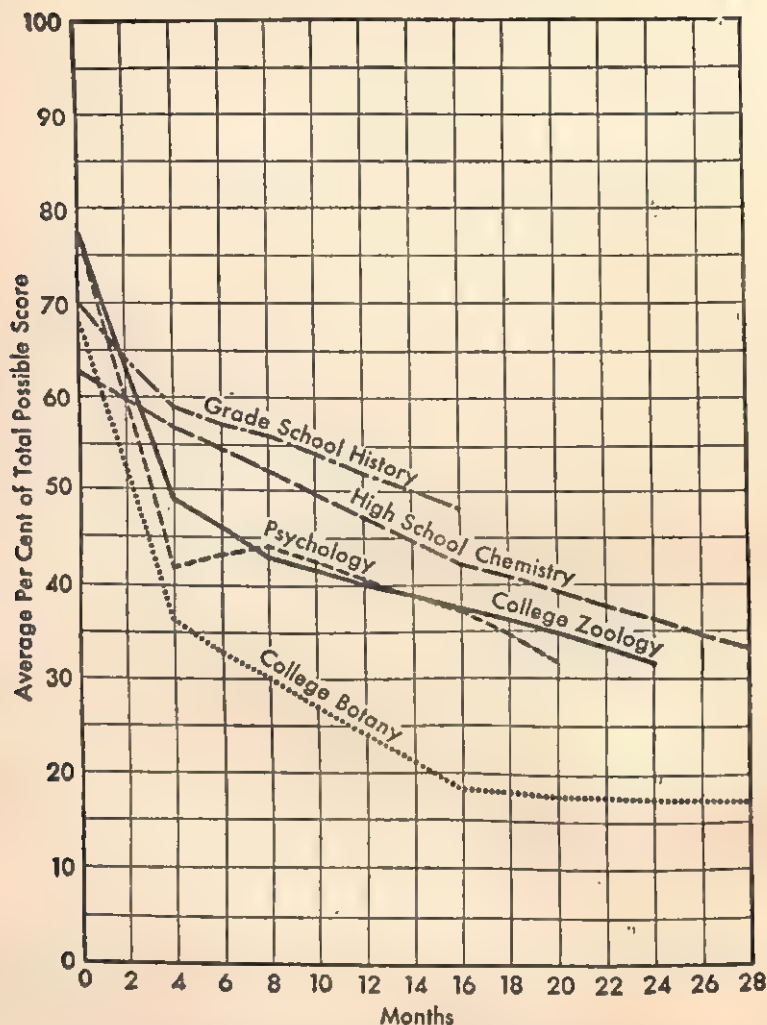
FIGURE 21. *Retention of One Elementary School Subject, One High School Subject, and Three College Subjects from 16 to 28 Months After the End of the Course*

From S. L. Pressey and F. P. Robinson, *Psychology and the New Education, Revised Edition*, p. 544. Copyright, 1944, by Harper and Brothers. (After Bassett, Greene, Powers, Johnson.)

what to remember and what to forget is important to a learner. It would be impossible and even foolish to attempt to retain in memory all the details of each day's experience. Although ability to recall individual experiences will lessen with the passing of time, this ability is not likely to be completely lost.

Speed of forgetting is affected by the lapse of time and by the degree or extent of learning. Figure 21 shows what is retained
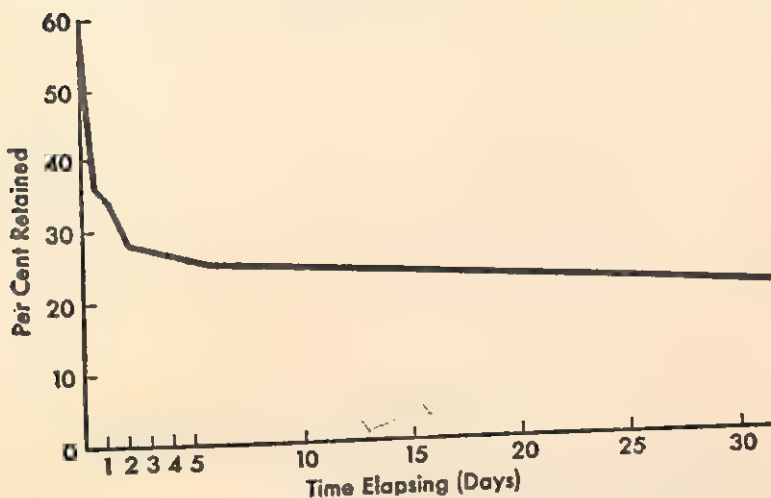
FIGURE 22. *Curve of Retention for Nonsense Syllables (Ebbinghaus)*

Adapted from Ebbinghaus' "Studies in Memory and Forgetting," in H. E. Garrett, *Great Experiments in Psychology.* Copyright, 1930, by D. Appleton-Century Company.

after a lapse of successive months up to twenty-eight months. Forgetting was most rapid during the first four months in all subjects measured. However, the amount retained after that time tapered off with the exception of college botany until the sixteenth month, when forgetting seemed to stop. In general, less than half of what was learned was retained at the end of two years.

Material that has meaning for the learner is retained longer than nonsense syllables or other meaningless material. While the curve of forgetting drops rapidly for both the nonsense and the meaningful material, it goes lower for nonsense syllables.[12] Figure 22 is a representation of the well-known Ebbinghaus curve of retention after verbal learning of nonsense material, resulting from his experience with the study of nonsense syllables, and reported in 1885. Many similar studies have been conducted since that date.[13] Although some of these show slight variations from Ebbinghaus' results, the general curve of forgetting still conforms with his.

What has been said about memorizing refers also to motor learning. The latter type of learning seems to persist longer

[12] H. Ebbinghaus; see H. E. Garrett, *Great Experiments in Psychology,* p. 273. D. Appleton-Century Company, New York, 1930.
[13] See H. I. Peixotto, "Protective Inhibition in the Recognition of Nonsense Syllables," *Journal of Experimental Psychology,* 37: no. 1:81–91 (1947).

than does memory for ideas. An individual may learn to ride a bicycle in his youth and, after a period of twenty-five years, ride without practice or re-learning. (The authors have personal knowledge of the truth of this fact. One of them lost an argument to a fellow psychologist who claimed that he could do it and did!) The reason for the apparent superiority in retention of motor learning over memorizing of factual material may be found partly in the fact that there is likely to be much more overlearning of a skill than of abstract material.

If the memorizing of material is accompanied by great interest or is done for a special purpose, the material may so impress the learner that he does not soon forget it. As an elementary school pupil one of the authors competed with a fellow pupil for the privilege of reciting a certain poem on a special occasion. So eager was the author to win in the competition that she learned the poem so well that the honor of reciting it was attained. As a result of all the factors in the situation the author can repeat the poem verbatim after many years without any attempts at relearning it. This experience is reflected in a study by Leavitt and Schlosberg which led to the conclusion that there is no justification in the generalization that all motor learning is retained longer than the memorization of some verbal material.[14]

QUESTIONS AND TOPICS FOR DISCUSSION

1. Select one of your skills and describe what you have done to develop that skill to its present level of perfection.
2. To what extent does the knowledge that progress is being made affect the development of a skill?
3. Discuss the factors that should be considered in the matter of spaced practice periods for motor learning.
4. What is the teacher's function in motor development?
5. Show by specific example the value of a learner's receiving correct sensations.
6. In what ways do your past experiences contribute to your present learning?
7. Select an object and report all the perceptions that you get from it. What was significant about the perceptions received?

[14] H. J. Leavi and H. Schlosberg, "The Retention of Verbal and Motor Skills," *Journal of Experimental Psychology*, 34: 404–417 (October 1944).

8. What illusions have you experienced? How do you explain them? Can you explain the fact that during 1947 many people said they saw flying saucers in the sky?

9. Why are correct perceptions so important to the learner?

10. Select an object, such as a *chair;* or a word, such as *liberty.* Show how meanings are attained and enlarged by the child.

11. What are the difficulties involved in teaching a child who has been deaf from birth to use such words as *high, warm, father, run?*

12. Write ten sentences describing a teacher you had last year to a person in Canada whom you have never seen. What difficulties did you encounter?

13. To what extent are visual or auditory aids used in the modern school? Discuss their value and the factors that may affect the extent of their utilization.

14. Enumerate advantages and disadvantages in the use of motion pictures in education.

15. What use can be made of television in education?

16. Why does reading a passage aloud in the presence of a group sometimes interfere with their understanding it?

17. Learn a short poem by using the whole method. Report the number of trials. Learn the following by the whole method. 64–81–53–72–65–97–48–26–89–34. How many trials did it take?

18. Plot your learning curve in any learning situation. Explain any changes made in the direction of the curve.

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16

REFLECTIVE AND CREATIVE THINKING

THE ability to think clearly is necessary to successful living. As a general rule, those persons who have mastered thoroughly whatever learning they have attempted are among the most efficient and respected in life. This does not mean that other factors are not involved, or that these factors are not equally important. Regardless of what the activity may be, those who outrank others in industry, agriculture, law, homemaking, statecraft, or any intellectual pursuit are above average in their ability to think effectively.

Thinking, interpreted as the association of ideas, is relatively simple and is employed by most learners. It can be made habitual by the time learners complete their high school work. The scientific process of thinking has been made to appear complicated. It is well to know the components of a thought and the steps that are followed in the thinking process, yet one can become an effective thinker without ever having heard of these terms.

REFLECTIVE THINKING

Factors involved. The mind becomes active in the attainment of mental goals. If the individual experiences a desire to attain a definite goal not attainable by habitual behavior patterns that include simple association of experiences and ideas, he begins to organize his ideas into categories that go beyond his accustomed thinking processes. He is faced with a problem situation. His thinking is aimed at the solution of a

problem in whole or in part, and can be designated as *reflective thinking* or *problem solving* as differentiated from simple thinking. Reflective thinking occurs when interference must be overcome in the attainment of an objective. When solutions are clear, no reflective thinking is required. It is when the individual must find new ways of reacting to a situation or of circumventing an obstacle that a challenge is given those mental processes involved in problem solving or reflective thinking.

The vehicles of thinking are words. These symbols (abstractions) make possible, through the meanings associated with the words, the ideas that are the outgrowths of the interrelatedness of experiences. Through these abstractions an individual passes from his existing mental patterns to the solution of the problem. The greater the experience with a word or an object, the greater the possibilities that variations of meaning will be attached to either. The word *red* may have many connotations, but when we limit it to *red meat* it sets up within us definite associations; to *red-letter day*, still others; to *red flag*, an entirely new set of associations are begun.

Involved in the meeting of a problem situation are definite mental operations based upon ability, interest, and experience. The individual must utilize (select from among his experiences) the habits and knowledges that are relevant to the particular problem situation and regroup these experiences into a new pattern of response applicable to the condition of the present problem. Among the mental processes involved can be identified the following:

1. Interest and attention directed toward a goal — *direction.*
2. Perception of relationships — *interpretation.*
3. Selection and recall of relevant experiences — *selection.*
4. Recognition of relationships among the component experiences — *insight.*
5. Formation of new mental patterns — *creation.*
6. Evaluation of the workability of solution — *criticism.*

Too many of us stop thinking about a problem when the first or second step of the thinking process is completed. We are content to accept the judgment of others, thus avoiding the process of reflective thinking. We search for a few experiences and satisfy ourselves with solutions based upon them. We may

use imaginary rather than actual facts, and permit solutions to be completed on the basis of these uncertainties. We are impelled to engage in all the aspects of good thinking, however, when others are not satisfied with our conclusions. We then either continue to rationalize or seek data that will support our point of view.

Levels of thinking. There are several levels of thinking, which may be defined as follows:

Reverie or daydreaming — mental activity on the level of present interest and associative response, in which the tendency is to escape from the real world to one of fancy.

Aesthetic appreciation — mental responses that have strong emotional components.

Acquisition of information — mental reaction sufficient to assimilate and recall new facts and experiences.

Reflective thinking and creative thinking (problem solving) — the former giving consideration to and calling up all the experiences relevant to the solution of a difficulty; the latter projecting the experiences so that new ideas result.

There are distinct stages of preparation, readiness, and mental reaction during the act of thinking. They are represented in Dewey's famous steps in an act of reflective thinking:

1. A felt difficulty — awareness of the problem.
2. Locate and define difficulty — comprehending the problem.
3. { Locate, evaluate, and organize information — classifying data.
     { Discover relationships — formulating hypotheses.
4. Evaluate hypotheses — accepting or rejecting hypotheses.
5. Apply the solution — accepting or rejecting the conclusion.[1]

Although these steps apply to a complete act of thought, they reveal themselves in a more definite form in problem solving. Man's ability to use language in such way that fine distinctions are made understandable has enabled him to perceive relationships clearly and so to organize his thinking that he is able to solve problems by discovering and applying new relationships. This scientific method in problem solving increases facility in reflective and creative thinking.

Many modern industrial organizations are spending large

[1] From J. Dewey, *How We Think*, Chapter 6. Copyright, 1933, by D. C. Heath and Company.

sums of money in the employment of research staffs. These research employees are concerned with ways of developing more and better products. They must be well trained in reflective and creative thinking. Similarly, during World War II the government engaged in many research projects. The atomic bomb, for example, was the result of the reflective and creative thinking of expert scientists.

As an illustration of ways in which reflective thinking can be used in problem solving the suggestions set forth by Parker are presented below:

To stimulate and assist pupils in carrying on reflective thinking the teacher should

I. Get them to *define* the problem at issue and keep it clearly in mind.
II. Get them to *recall* as many related ideas as possible by encouraging them
   1. To analyze the situation, and
   2. To formulate definite hypotheses and to recall general rules or principles that may apply.
III. Get them to *evaluate* carefully each suggestion by encouraging them
   1. To maintain an attitude of unbias, suspended judgment, or conclusion,
   2. To criticize each suggestion,
   3. To be systematic in selecting and rejecting suggestions, and
   4. To verify conclusions.
IV. Get them to *organize* their material so as to aid in the process of thinking by encouraging them
   1. To "take stock" from time to time,
   2. To use methods of tabulation and graphic expression, and
   3. To express concisely the tentative conclusions reached from time to time during the inquiry.[2]

CREATIVE THINKING

Creative thinking involves the same mental processes that are utilized in other forms of thinking, i.e., experience, association, and expression. Mental impressions are received, recalled, reflected upon, and applied. Out of this reaction process often arise creative expression and appreciation. The stages of creative thinking usually include preparation, a time of incubation, and insight.

[2] From S. C. Parker, *Methods of Teaching in High Schools*, pp. 199–200. Copyright, 1920, by Ginn and Company.

A long period of preparatory activity is needed. During this time materials may be assembled and integrated, or the various aspects of the problem investigated. Most creative artists pass through this preparatory stage, although it is possible for a person to create on the spur of the moment.[3] Anyone who produces an original production has sufficient insight, experience, energy, and persistence to create it. During the period of preparation, ideas continue to be formed. The span of time between the initial preparatory acts and the possible beginning of the actual production may be of such duration that discouragement may cause a discontinuance of the preparatory acts except as fragments of creative spurts appear now and then. Information, for example, that is acquired for immediate application has greater creative value than information that is acquired today for use in the distant future.

After the initial state of preparation, there follows a period during which possible vague aspects of creative expression are taking form. This is the period of incubation, and is followed by illumination which may come with amazing suddenness. As a result of his continued thought processes the individual suddenly becomes aware of relationships that earlier he had not recognized. An emotional reaction accompanies this sudden insight into the situation that finds expression in an exclamation such as "Eureka, I've got it!"

Inspirations come to us as we think and reflect. A most interesting collection could be compiled if each time we experienced one of these "flashes" we were to jot it down. Some of them might have future value. At one time or another each one of us has had the experience of hearing someone state a new idea or conclusion that we ourselves had thought about but not expressed. The credit goes to the person who gives expression to the idea. Some individuals have good ideas but lack facility in expressing them. It is the school's function, then, to help learners not only to gain ideas but also to express them in understandable language. Too often crowded courses of study leave little time for creative expression.

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[3] See J. L. Lowes, *The Road to Xanadu*, Houghton Mifflin Company, Boston, 1930; also C. Patrick, *Creative Thought in Poets*, Archives of Psychology, No. 178, Columbia University, 1935; and "Creative Thoughts in Artists," *Journal of Psychology* 4: 35-73 (1937).

Two characteristics identify creative thinking: (1) original outcome, and (2) irregular and unpredictable thinking procedure.[4] Goals and procedures differ, however. What one person considers an original act may have been done before. The approach and time consumed by two persons working separately may differ but yield the same results. Creative thinking, like all forms of mental activity, involves the process of identification. In every-day problem solving, however, the identities upon which conclusions are based are relatively simple and commonplace. Creativity implies the production of a totally or partially novel identity. The new identification emerges as known identities are mentally rearranged to form associations that are related to the desired goal.[5]

All about us are seen and taken for granted phenomena that have resulted from creative thinking on the part of an individual or a group of individuals who set themselves to the task of finding new solutions to practical problems. The successive advances made to improve air travel, to implement the handling of seed corn, to regulate temperature, to bring the world of affairs to our living room — in fact, to provide not only the necessities but the luxuries of life — are for the most part the resultants of reflective and creative thinking.

INTERPRETATION OF STEPS IN PROBLEM SOLVING

Awareness of the problem. The individual must become aware of a difficulty. Unless an awareness is aroused there is no problem. As an individual's wants or drives are directed toward a goal, they may be interfered with. It is the overcoming of the obstacle or obstacles that sets the problem for him.

In any learning situation the teacher should help learners to recognize the problem. An excellent technique, and perhaps one of the simplest, is to ask a thought-provoking question, a question that cannot be answered merely by repeating material that has been read, heard, or learned in some other way. The thought question calls for the kind of thinking that results in

[4] See D. M. Johnson, *Essentials of Psychology.* pp. 206–208. Copyright, 1948, by McGraw-Hill Book Company.
[5] See R. Stagner and T. F. Karwoski, *Psychology*, p. 419. Copyright, 1952, by McGraw-Hill Book Company.

a new opinion or a new belief based upon the experience of the individual, as he is stirred to seek a solution. Learners need help in becoming aware of problems. The teacher is there to direct the thinking of learners and to arouse in them this awareness. A thinker must be stimulated, and must be willing to question or doubt. It does not follow, however, that a doubter necessarily is a thinker. Unfortunately, too many persons doubt without cause. According to Dewey

... the origin of thinking is some perplexity, confusion, or doubt. Thinking is not a case of spontaneous combustion; it does not occur just on "general principles." There is something that occasions and evokes it. General appeals to a child (or to a grown-up) to think, irrespective of the existence in his own experience of some difficulty that troubles him and disturbs his equilibrium, are as futile as advice to lift himself by his boot-straps.[6]

Whenever a question is used to stimulate thinking or to set the problem, the question must be adapted to the level of the experience and understanding of the learner. For young children it should be relatively simple and connected with a concrete situation, including familiar materials. The challenge may be less direct for older learners but must be within the range of their experience, even though more abstract situations may be involved than on the lower age level.

Comprehension of the problem. Following the sensing of the problem, the individual must be able to isolate it, to define it, to understand it. This requires (1) the ability to recall related past experience and (2) an attitude of interest in overcoming the obstacle. If an individual has some understanding of the situation at the outset, he is likely to attack it with vigor and success. As he *feels* an increasing acquaintance with the problem, more and more useful suggestions come to him relative to it and its possible solution. To the trained engineer, a question concerning the working of a thermostat becomes a problem since he feels the urge to give an answer based upon his particular knowledge. The question, however, would not be a problem to an uninterested child or even adult. A house owner, for example, has been quoted a fire insurance rate of $64 for three

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[6] From J. Dewey, *How We Think*, p. 15. Copyright, 1933, by D. C. Heath and Company.

years, but he wants to know the annual rate. When he is told that the three-year rate is two and one-half times the annual rate he has a felt difficulty and attempts a solution, i.e., how much money he will save by taking the three-year rate. To the house owner it is a problem. To an adolescent, however, it would be a problem only if he wanted to show that he could master that kind of example.

The ability to comprehend fully all the component factors of a problem situation is productive of better thinking. To be able to concentrate sufficiently in order to retain the essential features of the problem as the solution is in process is a valuable asset and is a characteristic of successful thinking. Clarification of the problem will release energy for its solution.

Location, evaluation, and organization of information. In order to avoid errors in thinking it is important that adequate information be at hand. If the individual does not possess sufficient data he should continue with his research until he has the necessary facts. These facts, however, need to be evaluated and classified. The correctness of a conclusion depends upon the particular facts used and the way they are organized in support of a hypothesis. Much superficial thinking and many erroneous conclusions result from attempts at solutions of problems without sufficient data. We are willing to accept the judgment of an individual who has an abundance of information in a particular field. We realize that he brings to bear upon his conclusion a greater mass of carefully selected data than does the individual who is only slightly acquainted with the field but who is willing to generalize with insufficient information. We think of the former as an expert because he is meticulous in the assembling of data and critical in his analysis of the material. His conclusions are acceptable because he has well-organized mental patterns as a result of his well-established thinking habits and emotional objectivity. The well-trained thinker fully realizes the inadequacy of the conclusions of a novice in a specialized area, and rejects or discounts them.

Data can be supplemented in many ways. Information can be secured vicariously from books or pictures or by way of radio, motion pictures, lectures, and the like. In such instances the thinking of the individual is limited and is conditioned by the ideas of others — authors, painters, commentators, lecturers,

and teachers. Data also can be secured directly from their source through observation, experimentation, or other forms of research. When this is done, the adequacy of the conclusion depends upon the individual's ability and willingness to secure and to organize sufficient and accurate data upon which to base his judgment. Phenomena in the environment may or may not be the bases of individual observation or study for the purpose of arriving at an explanation or a conclusion. For a child the source of the water that collects on the outside of a glass of cold water in a humid room may constitute a problem. The child may try to figure out how the water gets through the glass. However, most adults long since have accepted the explanation given by scientists. To these adults the phenomenon no longer is a problem; it is a matter of information.

Discovery of relationships and formulation of hypotheses. Along with comprehension of the problem, and gathering and evaluation of the data go tentative inferences or preliminary hypotheses. These are based upon the perception of relationships among the data. The direction taken by the thinking concerning these relationships depends upon what is being sought. The question to be answered or the goal to be reached helps in giving form to these inferences. Hence accurate and sufficient information is basic to adequate inference.

Persistence in activity and zeal in the discovery of the facts are characteristic of the thinker as he attempts to establish his inferences. He will need to try one mode of thinking and then another until he finds a workable hypothesis — just as the picture puzzle is put together by trying to fit one or another part into the pattern until the right piece is found. However, many false moves can be eliminated by careful consideration of relevant data. An experienced picture puzzle worker recognizes at a glance that certain pieces cannot be used at a particular construction point. The child, on the other hand, may need to experiment with the pieces that are eliminated mentally by the older and more experienced person.

If, during the period of reflection or incubation, an individual does not gain insight into the relationships sought, after spending much time and energy on the problem, he may give up in despair. Thus we find that some fail while others who have the necessary persistence and zeal succeed.

Mental set also conditions our thinking. Habits of thinking need to be developed but they should not become stereotyped and inflexible. For example, if we suggest to another person that the word MacHenry is pronounced *Mac*Henry and then ask him to pronounce m-a-c-h-i-n-e-r-y, he may respond with MacHinery and not with machinery. Or if he is asked which is correct — seven and three *is* eleven or seven and three *are* eleven, he may concentrate on the agreement of subject and verb and fail to recognize the incorrect sum. This conditioning of thinking sometimes is referred to as the atmosphere effect of the thinking process.

Evaluation of hypotheses. Some psychologists give three steps in the evaluation of hypotheses. Gates and others state that the evaluation of tentative solutions must be careful and thorough. They suggest that "This means, first, that one should determine whether the conclusion completely satisfies the demands of the problem. Second, one should find out whether the solution is consistent with other facts and principles which have been well established. Third, one should make a deliberate search for negative instances which might throw doubt upon the conclusions." [7] They further point out that "These procedures are facilitated not only by the ability to locate and organize data effectively, but also by attitudes of suspended judgment and critical evaluation." [8]

Our thinking tends to follow established patterns. We therefore need to guard against the tendency to put too great reliance upon those habits of thinking that may be flavored with individual interest and prejudice. A critical thinker realizes that all aspects of a possible solution should be considered. Even though one may be mentally set to accept one hypothesis, the merits of alternate suggestions or hypotheses should be examined carefully and compared. As each is considered in turn, those that do not seem to apply are abandoned. It may be necessary to check many leads — in some situations, a hundred or more — before the right hypothesis is found.

In trying to find a solution to a problem, an individual too often is restricted by his own mental sets. A teacher should help

[7] From A. I. Gates *et al.*, *Educational Psychology*, p. 484. By permission of The Macmillan Company, publishers, 1942.
[8] *Ibid.*, p. 484.

a learner to recognize personal biases, prejudices, or other limitations to his thinking. When an attitude is so strong or so inflexible that perception, ideation, or judgment is distorted, the individual must learn first to discard his prejudices and then to formulate an objectively arrived at hypothesis. For example, the emotional disposition may have to be reconditioned, and a desire inculcated to obtain more adequate information in order that prejudices against races and nationalities may be modified.

Application. The application of the solution to a problem is the final step in the process of problem solving and serves as a check on the correctness of the solution. To be able to apply a general principle to a particular situation is the test of the worth of the principle to the individual as well as a test of the principle itself.

The application of a solution can be made more easily to concrete situations than to abstract. However, conclusions concerning purely intellectual problems should be applied to specific situations to discover whether they conform with recently formulated ideas. In order to ensure the usability of the products of abstract thinking, the new ideas should have their proper effect upon attitudes, beliefs, or habit patterns previously formed. The teacher should foster a critical attitude toward the applying of solutions to the end that these will be critically evaluated and tested before they are accepted as correct conclusions.

Value to education. Teachers should be trained in the scientific method of problem solving. Only in this way will they be able to guide learners toward the development of thinking that is accurate, clear, and objective. There are many advantages to the learner in the problem method of teaching. It stimulates interest, establishes confidence in ability to do things, aids in the making of associations, and provides experience in the utilization of scientific procedures in solving problems.

Competent teachers provide problem situations and make it possible for learners to have access to needed data. Learners receive excellent training as they follow the procedures of reflective thinking under the guidance of well-trained teachers. The latter are concerned with training their learners *how to think* as much as in assisting them to add content to content. The challenge to the teacher, then, is to provide adequate problem situations that will make this thinking possible. In this way learners

are enabled to sense the problem; define it; locate, evaluate, and organize the necessary information; discover relationships and formulate hypotheses; evaluate the hypotheses; and apply the solution.

Are all of the conditions of a problem included in the following? [9] Is it a problem? Can the example be solved? Can you solve it?

1. A fur buyer in Alaska sent his partner in Chicago the following telegram. How much money did he want?

$$
\begin{array}{r}
S\ E\ N\ D \\
M\ O\ R\ E \\
\hline
M\ O\ N\ E\ Y
\end{array}
$$

There is a solution to this problem, but the value in training to solve it is no greater than that experienced in more practical examples. For example, a river has overflowed its banks and flooded the surrounding territory. What difficulties are faced by the people? What can be done to prevent floods? This and similar questions have more practical value and stimulate reflective thinking just as effectively as do those problems that are largely abstract and of little practical value.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss the relationships that exist between ability to think and general intelligence.
2. What values does an individual in a democracy derive from being able to participate in reflective and creative thinking?
3. To what extent is reflective or creative thinking required by the average farmer, housewife, salesman, banker, physician, or teacher in meeting his or her responsibilities?
4. What are the usual circumstances under which inventions are made?
5. What are among the important limitations to the development of effective thinking?
6. Name as many mistakes of poor thinking as you can.
7. What is the difference between learning *content* and learning *how to think with content?*
8. To what extent should teachers train learners in right methods of thinking?

[9] From S. S. Gray, "Problem Solving," in *Educational Psychology*, Third Edition, edited by C. E. Skinner, p. 389. Copyright, 1951, by Prentice-Hall, Inc.

9. What are your specific weaknesses in reflective or creative thinking?

10. How important is it that the careful thinker adhere to the steps of scientific thinking?

11. In training learners to develop good thinking habits, should you choose problems that are easy, moderately hard, or very hard for them? Defend your answer.

12. If doubt arises as you read a passage or as you listen to a conversation, what do you do to check on the facts or the conclusions?

13. A teacher of physics once placed T–H–I–N–K above his blackboard. Discuss the value, if any, of this device.

14. How much and what kind of thinking is required in the solving of crossword puzzles?

15. Do you believe that if you study mathematics you will thereby become an effective thinker. Justify your answer.

16. What should be the role of the teacher in the development of reflective thinking? In helping learners to solve problems?

17. Can you find the fifty-three triangles in Figure 23?

18. How is language related to reflective thinking?

19. When is a problem an easy one? When a difficult one? What accounts for the difference?

FIGURE 23. *Triangles*

20. In the following example in multiplication each letter represents a missing number. Can you find the numbers?
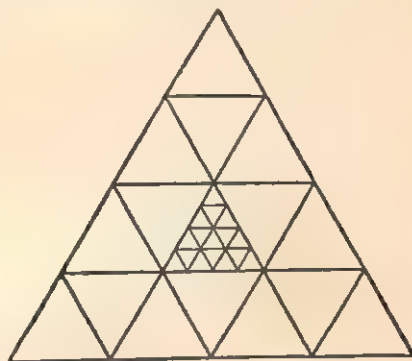
$$
\begin{array}{r}
\text{X 5 X} \\
\text{Y Y 3} \\
\hline
\text{A 6 B 5} \\
\text{A B B 5} \\
\text{A B B X} \\
\hline
\text{A C E 8 A X}
\end{array}
$$

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17

IMPORTANCE OF TRANSFER OF TRAINING

During his years of formal schooling an individual cannot be trained to meet adequately every specific situation in which he will find himself in the course of his life. Hence it becomes the function of psychologists and educators to determine, in so far as it is possible, the extent to which the mastery of this or that skill or subject matter, or the development of this or that attitude or habit may be expected to fit the individual learner to apply successfully what he has learned in one learning situation to another or to his other life experiences.

The carry-over of habits of thinking, feeling, or working, of knowledge or of skills, from one learning area to another usually is referred to as the *transfer of training*. Since it is impossible, as was suggested above, to train a person in every detail for meeting every life situation, it is the function of the school to include in its offerings the learning opportunities most likely to give the learner those attitudes, habits, skills, and knowledge tools that shall serve as the bases of application in his day-by-day living. Herein lies the value of the functional approach to learning.

What the educational fundamentals shall be and how they may be expected to function are questions that have been the concern of educators from early times to the present. Various theories of the transfer of training have been advanced through the years; many experiments have been engaged in; and much discussion has been and still is in progress concerning the significance that should be attached to any school subject from the

point of view of its possible transfer value. At present, there is general agreement that learning in one situation can affect the thinking and behavior of an individual in another situation. Just what the nature of this transfer is and how the carry-over of learning best can be effected are problems which require our thoughtful consideration and study.

VARIOUS THEORIES OF TRANSFER

Formal mental discipline. From the Age of Pericles through the nineteenth century, the chief purpose of education was regarded by many educational philosophers to be the formal training of the mind. In Plato's *Republic* reference is made to the great value of mathematics, for example, as a quickener of apprehension.[1] The following statement quoted from a book on teaching, published in 1885, also affirms the value of formal discipline in education:

The discipline of the mind, then, is the great thing in intellectual training; and the question is not, how much have I acquired — but, how have my powers been strengthened in the act of acquisition? [2]

The Committee of Ten of the National Education Association included in their well-known report (1894) on prevailing practices in the secondary school and recommendations for improvment a statement of the belief of the majority of the committee that the subjects studied by a high school learner were relatively unimportant provided that the subjects offered "strong and effective mental training." [3] Amplification of this statement is contained in the following excerpt from the committee's report on history:

The principal end of all education is training. In this respect history has a value different from, but in no way inferior to, that of languages, mathematics, and science. The mind is chiefly developed in three ways: by cultivating the powers of discriminating observation; by strengthening the logical faculty of following an argument from point to point; and by improving the process of comparison, that is, judgment.

[1] Plato, *The Republic*, revised edition (Trans. by Benjamin Jowett), Book VII. P. F. Collier and Son, New York, 1901.
[2] From D. P. Page, *Theory and Practice of Teaching*, p. 97. American Book Company, New York, 1885.
[3] National Education Association, *Report of the Committee of Ten on Secondary School Studies*, p. 53. American Book Company, New York, 1894.

As studies in language and in the natural sciences are best adapted to cultivate the habits of observation; as mathematics is the traditional training of the reasoning faculties; so history and its allied branches are better adapted than any other studies to promote the invaluable mental power which we call the judgment.[4]

The opinions stated above as well as their practical application influenced education for many generations. They are based upon what is known as *faculty psychology*, an explanation of the functioning of the mental processes that now is generally discredited. According to this theory, the mind has mental powers or faculties, such as memory, reason, judgment, attention, the will, observation, and the like, each of which functions as a separate entity that can be strengthened or improved by exercise. For example, faculty psychologists believed that the strengthening of memory could be achieved through the memorization of long and difficult passages. Such exercise was assumed to develop in the learner the power to remember well whatever material by which he later might be stimulated. In the same way, participation in difficult, abstruse reasoning, regardless of the content of the reasoning exercise would enable the individual to meet successfully any problems which he later might need to solve through the application of his trained reasoning faculty.

Although Locke and Herbart and other noted educators did not seem to be unduly concerned about the value of mental discipline as an educational objective, many advocates in the past (and a few in the present) of subject matter that had no practical value for the student attempted to justify the inclusion of such subjects in the curriculum on the basis of their great disciplinary value. There still are in operation commercially controlled systems of improving one's memory, will power, concentration, and the like, through ten, twenty, or more "easy lessons." Inclusion of certain subjects in the curriculum, such as Latin, geometry, or chronologically arranged factual history, still is being justified in terms of their value as mind trainers.

The advocates of formal discipline claimed that the study of "practical" or utilitarian subjects was unnecessary, since thorough mastery of a few well-selected subjects having disciplinary value would prepare the learner to meet adequately

[4] *Ibid.*, p. 168.

all situations in which he might find himself. Even manual training, mechanical drawing, home economics, and similar subjects were taught in some of the schools of the nineteenth and the beginning of the present century not from the point of view of their practical application but as disciplinary training and a means of strengthening perception, sense of proportion, and other specific mental faculties.

The study of geometry, for example, was included in the curriculum for the purpose of strengthening the reasoning faculty. The faculties of perception and ideation supposedly were developed through the study of grammar and language usage. It is probable that training in any one of these subject fields will help an individual solve problems in other areas, provided that he has adequate background information and utilizes appropriate techniques. Good thinking implies adequate training in mental activity. But it does not require the functioning of hypothetical faculties, as was believed by the faculty psychologists.[5]

Modern educators recognize the value of training young people to be clear thinkers, to be careful workers, and to develop constructive attitudes toward themselves and other people. However, we believe that this training can be accomplished through the study of learning content that at the same time may have other specific and practical values. Clearly, the modern attitude toward the objectives that should guide educational content and practices differs from that of the 19th century.

Curriculum construction is not dominated by the principle of learning transfer through formal discipline. Curricular offerings are geared to the actual needs of the learner in accordance with societal demands. Teaching emphasis is placed on the development of specific skills, bodies of knowledge, and attitudes. Consequently, many subjects have been added to the curriculum. Moreover, any general patterns of thinking that result from learning are tested by the application to any or all relevant situations. In addition, attention has been given to the meeting of individual differences in abilities and interest.[6]

[5] See A. M. Jordan, *Educational Psychology*, Fourth Edition, Chapter 7. Copyright, 1956, by Henry Holt and Company.

[6] See J. M. Stephens, *Educational Psychology*, Revised Edition, Chapter 14. Copyright, 1956, by Henry Holt and Company.

The theory of identical elements or components. Modern psychologists believe that the mental functions, such as perception, attention, memory, and reasoning, are not separate entities but interrelated aspects of the total functioning of the mental processes in any given situation. This belief has changed educational philosophy and practice. Formal mental discipline as the objective of learning has given place to an emphasis upon a learner's total reaction to any given learning situation in which many complex mental processes are involved. The question now becomes that of attempting to determine the extent to which learned responses in one situation may be of benefit to the learner in other situations.

The factor of resemblance or similarity between situations has considerable effect upon the amount and kind of carry-over that can be expected from one situation to the other. As a result of his experiments in learning, Thorndike came to the conclusion that transfer from one situation to another depends upon the extent to which there are present in both situations certain *identical elements* of content, attitude, method, or aim. He expresses his theory in the following words:

> The answer which I shall try to defend is that a change in one function alters any other only in so far as the two functions have as factors identical elements. The change in the second function is in amount that due to the change in the elements common to it and the first. The change is simply the necessary result upon the second function of the alteration of those of its factors which were elements of the first function, and so were altered by its training. To take a concrete example, improvement in addition will alter one's ability in multiplication because addition is absolutely identical with a part of multiplication and because certain other processes, e.g., eye movements and the inhibition of all save arithmetical impulses, are in part common to the two functions.
>
> Chief among such identical elements of practical importance in education are associations involving elementary facts of experience, such as length, color, number, which are repeated again and again in different combinations.[7]

However, since the "identical elements" of the one function that affect another cannot always be identified easily, Thorndike also said, "By identical elements are meant mental processes

[7] From E. L. Thorndike, *Educational Psychology*, Vol. II, pp. 358–359. Bureau of Publications, Teachers College, Columbia University, 1913.

which have the same cell action in the brain as their physical correlate." [8] This explanation is in keeping with Thorndike's theory of behavior as neural responses to stimuli which affect the organism.

Later, Woodworth and other proponents of this theory came to recognize that in common usage the term *element* had taken on the connotation of something that is indivisible or a very simple, unanalyzable part of a whole. Since the presence of a common functional or part-functional trend that is relatively complex may result in transfer, Woodworth suggested that the term "component" or "constituent" be substituted for the term "element." Hence, this theory now is referred to generally as the Theory of Identical Components.

According to this theory it is possible for a fact, a procedure, or an attitude learned in one situation to function in another similar situation. For example, a girl who has practiced hemming a towel by hand may be expected to use this acquired sewing skill in other situations, such as the hemming of skirts or of curtains. It would not mean, however, that as a result of her experience in hand sewing she would become equally proficient in hemming by means of a sewing machine, since different components are present in the latter operation. Again, a person who has become well acquainted with the writing style of a particular author as a result of an intensive study of his writings may be enabled thereby to recognize this author's style in a piece of writing that is not identified by name.

Number combinations, units of measurement, significant dates, order procedure, methods of work, personal habits, attitudes toward people or things have carry-over value from one learning situation to many others, if there is attached to the transfer a satisfying association. For instance, one of the authors was impressed in a college classroom by the definition of *pragmatism* given by one of the members of the class. Many years later, the author used with success this same definition in an examination situation.

The theory of generalization. The sponsor of this theory, Charles Judd, considered the term *transfer* to be synonymous with *generalization*. He placed emphasis upon the value of ability

[8] From E. L. Thorndike, *Educational Psychology, Briefer Course*, p. 269. Bureau of Publications, Teachers College, Columbia University, 1916.

to understand and to apply to specific situations broad principles and meanings and to generalize and organize specific experiences. His own words are:

> When a pupil fully grasps a scientific generalization or when he gains a view of a wide range of relations, he acquires independence and breadth of intellectual power and becomes capable of transferring training to situations that are different from those in which he was first trained. The most impressive fact about human intelligence is that it brings to the solution of each problem encountered by an individual a vast body of personal and social experience.[9]

According to this theory the developing of special skills, the mastery of specific facts, the achieving of particular habits or attitudes in one situation have little transfer value unless the skills, facts, habits are systematized and related to other situations in which they can be utilized. For example, it is not enough for a child to learn that he should arrive at school punctually every morning or that he should refrain from annoying his classmates by talking in class or interfering with their activities. These habits of punctuality and consideration for others should become so much a part of the child's attitude patterns as the result of his school training that they will carry over into his other life activities. He should become generally punctual for meals, in his occupational activities, and in meeting his social obligations. In the same way his school training should cause him to be considerate of the rights of others by conducting himself properly during theatrical, musical, and motion picture performances, on public vehicles, and in similar situations.

Again, habits of study and work, methods of procedure, and knowledge of facts and phenomena acquired during formal learning experiences can be profitable to an individual only to the extent that he understands them and that his personality is changed by them so that he is able to apply the generalized experiences to specific life situations.

There are various forms or modifications of the theory of generalization. The Gestaltists believe that the learning of a *Gestalt* or a meaningful configuration presumes a kind of organization that, as learning takes place, modifies the organism. As the result of participation in a specific learning situation,

[9] From C. H. Judd, *Educational Psychology*, p. 514. Copyright, 1939, by Houghton Mifflin Company.

an integrated system of responses is acquired which can be repeated as a whole or a configuration in other situations in which this particular kind of response might be applicable. If an accustomed total of responses is not satisfying to the individual, further modifications of behavior are sought so that a more effective system is created that shall serve the learner's desired end through the achieved modification of the former pattern of response.[10]

According to Bode, an individual acquires as the result of his learning experiences a series of enlarging complexes of reaction factors. At any stage of his learning, this apperceptive mass of experiences determines the meaning that he shall attach to the elements of a new situation and directs his response to it in terms of his integrated experience, so that "we meet the new situation with an old meaning and . . . transfer takes place through meanings."[11]

To these modifications of Judd's generalization theory can be added the contributions of Bagley and Ruediger. These men favored the development of "conscious ideals" as an effective means of bringing about transfer from one situation to another.[12]

Comment. The theories briefly treated above give evidence of the general acceptance of the possibility of a transfer of learning. Whether one prefers to explain transfer in terms of specific habit formation by way of identical components, or as a general change in an individual's personality that affects his later behavior, the fact remains that we still do not know how this transfer or carry-over is effected.

We do know that we learn through experience. But how we learn and how well we learn to adapt our previous experiences in new situations constitute problems that have stimulated and continue to stimulate the conducting of many studies and experiments, the results of which should have practical significance for curriculum makers, school administrators, and classroom teachers.

[10] See K. Koffka, *Principles of Gestalt Psychology*. Harcourt, Brace and Company, New York, 1935.

[11] See B. H. Bode, *Conflicting Psychologies of Learning*, p. 275. D. C. Heath and Company, Boston, 1929.

[12] See W. C. Bagley, *The Educative Process*, p. 208, The Macmillan Company, New York, 1905. W. C. Ruediger, "Indirect Improvement of Mental Functions through Ideals," *Educational Review*, XXXVI:364–371 (1908).

EXPERIMENTS DEALING WITH TRANSFER

Types of studies. Many of the investigations of the transfer effects of learning have been conducted in psychological laboratories. This is especially true of the earlier experiments, which for the most part consisted of attempts to test the validity of the theory of formal discipline. However, laboratory experiments continued to be engaged in for the purpose of studying some of the more or less transfer-producing conditions that are relatively specific in nature.

There has been evidenced meanwhile a growing interest in studies of transfer in the less formal classroom situations. The purpose of many of these investigations has been to discover the extent to which learning in one subject area advances or retards learning in another.

Studies of sensori-motor transfer. Cross-education (training that affects the performance of corresponding members of the opposite side of the body) has received much laboratory study. Starch's experiment with the mirror drawing of a star (1910) is one of the best known of these investigations. Starch attempted to discover what effect learning to draw a star pattern with the right hand by the mirror drawing method had upon the ease of learning to draw the same star pattern with the left hand. The results gave indication of the effects of transfer that now are recognized as resulting from the control by the brain of both the right and the left hand rather than as a transfer of skill from hand to hand.[13] Similar studies of cross-education by Ewert, Munn, Bray, and Cook indicate that factors such as increased confidence, acquaintance with problems, and improved techniques may account for improved performance.[14]

Webb conducted a study with animals and human beings for the purpose of determining the transfer effect of tracing a pathway through one maze upon performance in threading pathways

[13] D. Starch, "A Demonstration of the Trial and Error Method of Learning," *Psychological Bulletin,* 17:20–23 (1910).

[14] See P. H. Ewert, "Bilateral Transfer in Mirror Drawing," *Pedagogical Seminary,* 33:235–249 (1926).

N. L. Munn, "Bilateral Transfer of Learning," *Journal of Experimental Psychology,* 15:343–356 (1932).

E. W. Bray, "Transfer of Learning," *Journal of Experimental Psychology,* 11:346–367 (1928).

T. W. Cook, "Studies in Cross Education," *Journal of Experimental Psychology,* 16:144–160, 679–700 (1923); 17:749–762 (1934).

in five other different mazes. It was concluded from the results of this experiment that there are carry-over effects from practice in one sensori-motor activity to another, but that the amount of transfer probably depends upon the extent to which the type of material with which the original learning is concerned is similar to that in which the results of the previous learning are to be applied. Individual differences also showed themselves. The amount of transfer varied with the individual subjects of the experiment from 20 per cent to about 77 per cent.[15]

Studies of transfer and higher mental functions. The first to put to test the claims of the advocates of transfer of training through mental discipline was William James of Harvard, toward the end of the nineteenth century. In an attempt to discover whether general ability to memorize would result from practice in the memorization of the poetry of a particular poet, James himself memorized 158 lines from Victor Hugo's *Satyr* and kept account of the time that it took him. He then devoted thirty-eight days (about 20 minutes per day) to the mastery of the first book of Milton's *Paradise Lost*. After this intensive period of practice in memorization, he selected another 158 lines from the *Satyr* and memorized them. He discovered that he needed more time to learn this selection than he had taken for the first selection from the *Satyr*. He checked his own performance against that of four other persons. Three of the four showed a slight decrease in time in memorizing as a result of intensive study, while the fourth experimenter showed a slight increase. Because of the lack of adequate control the results of these experiments could not be considered to be entirely conclusive. However, the investigation led James and others to believe that formal discipline is not an efficacious means of improving the memory.[16]

Other psychologists also have conducted studies of transfer of training as applied to memory, perception, and reasoning. The results of the experiments dealing with memory seem to indicate that any improvement that took place was slight and related to the similarities that existed between the materials of the origi-

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[15] See L. W. Webb, *Transfer of Training and Retroaction.* Psychological Review Monographs, Vol. XXIV, No. 104. Psychological Review Company, Princeton, N. J., 1917.

[16] See W. James, *Principles of Psychology.* Henry Holt and Company, New York, 1890.

nal learning situation and those for which transfer effects were tested.[17]

Thorndike's and Woodworth's experiments in transfer in the field of perception (1901) show some transfer from one situation to another, exhibited in improved observation and perception. The experimenters themselves concluded that whatever transfer occurred could be explained in terms of identical elements of procedure, habits, and methods.[18] Kline's study in the cancellation of letters seemed to yield results that could lead to the conclusion that practice in cancellation of letters may decrease rather than improve ability to cancel certain types of words.[19]

Winch conducted an experiment with school children in order to discover the effect of learning to solve arithmetic problems upon other forms of logical reasoning. He reported that the children who received a ten-week training in arithmetic reasoning gained about 30 per cent in power to succeed in logical tests over the control group which received no such special learning.[20]

As a result of an experiment with mechanical puzzles, Ruger [21] concluded that there was transfer from practice with one puzzle to performance in another. He explained this transfer in terms of factors such as "heightened attention to the task, shift from self-consciousness to a problem attitude, improved methods of attack, analysis and generalization of procedure, and an awareness of the similarity of the new case to the old." [22]

In a study by Barlow that was based upon improvement in discovering the moral of selected fables from Aesop, paired experimental and controlled groups of children and adults were used. Between the first and second tests, the experimental group received twelve twenty-minute lessons in which they were given training in analysis, abstraction, and generalization. As a result,

[17] See W. G. Sleight, "Memory and Formal Training," *British Journal of Psychology*, IV:nos. 3 and 4:386–457 (1911).

[18] E. L. Thorndike and R. S. Woodworth, "The Influence of Improvement in One Mental Function upon the Efficiency of Other Functions," *Psychological Review*, 8:247–261, 384–396, 553–564 (1901).

[19] L. W. Kline, "Some Experimental Evidence in Regard to Formal Discipline," *Journal of Educational Psychology*, 5:259–266 (1914).

[20] W. H. Winch, "Transfer of Improvement in Reasoning in School Children," *British Journal of Psychology*, XIII:no. 4; 370–381 (1922).

[21] H. A. Ruger, *The Psychology of Efficiency*, Chapter VI. Teachers College, Columbia University, New York, 1926.

[22] K. L. Kingsley and R. Garry, *The Nature and Conditions of Learning*, Second Edition, p. 504. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1957.

in the second test on the interpretation of fables, this group gave evidence of improved performance that was not shown by the control group.[23]

Studies of transfer in problem solving. Because of the complexity of the mental functioning involved in problem solving, it is difficult to obtain desired results from studies of transfer in this area. However, there have been several excellent investigations to which reference will be made.

Gray conducted an experiment in code substitution with two comparable groups. After both groups had been subjected to code substitution tests, one group learned a new code by the rote method, while the other group studied a new code, by a method in which emphasis was placed upon its logical relationships. Then both groups again were given code substitution tests. The fact that the second group had been trained to look for possible relationships in code material resulted in an advantage of twenty per cent in their performance over that of the rote learners in the second testing situation.[24]

Among the studies of transfer as related to reasoning and problem solving should be included Judd's investigations that led him to formulate his theory of transfer by generalization. One of the best known of these investigations is the Judd-Scholckow experiment that dealt with the hitting of a target under water, a task that was made more difficult than ordinary target shooting because of the added factor of refraction of light from the target by the water. Using two groups of fifth and sixth grade boys, Judd conducted the experiment by giving one group instruction concerning the principles of refraction that was denied to the other group. At first both groups of boys practiced throwing the darts at targets that had been placed twelve inches below the surface of the water. During this practice period the instruction received by the boys of the one group appeared to give them no advantage over the other group. However, when the target was raised to within four inches of the surface, the performance of the instructed group surpassed that of the boys who had received no theoretical explanation of refraction. Judd

[23] M. C. Barlow, "Transfer of Training in Reasoning," *Journal of Educational Psychology*, 28:122–128 (1937).

[24] S. T. Gray, "A Comparison of Two Types of Learning by Means of a Substitution Test," *Journal of Educational Psychology*, 9:143–158 (1918).

explains the difference in behavior of the two groups in the following words:

As contrasted with the boys who had no theoretical training, the boys who knew the theory of refraction adapted themselves rapidly to the second depth of water. Their ability to deal with the new situation grew out of the fact that they recognized the true relation between this and the earlier situation. The theory had put all their experiences — those without water, those with one depth, and, finally, those with another depth — into a single general scheme of thought. They were aware of the fact that there are gradations in apparent displacement, and, when they encountered a second depth of water, they were able to deal with it promptly and efficiently. In other words, after they had mastered one practical situation and had comprehended it in the light of their theoretical knowledge, they were able to solve rapidly and with all the advantages of generalized experience a new problem which involved both practical adjustment and analysis. Theory is a kind of summary of many experiences. It makes possible the proper interrelating and interpreting of a whole body of varied experiences.[25]

Other studies conducted by Judd as well as those of Ruediger, Hendrickson and Schroeder, Gates, and Katona [26] would seem to bear out Judd's original thesis concerning the effect of theory upon practice. Understanding, organizing, and generalizing experience assist in the application of the results of learning to the specific requirement of new experiences and situations. Concerning this Judd says:

Science instruction is often a failure because it consists in mere drill on isolated items of information. The teaching of mathematics frequently fails because it does not go beyond the presentation of authoritative statements which are true but have no vital meaning to pupils. The preventive for the narrowness of school teaching and for lack of transfer is to be sought in the organization of instruction in such a way that the learner will constantly be made to see the broad relations of items of experience. A pupil should be taught arithmetic by methods

[25] From C. H. Judd, *Educational Psychology*, p. 509. Copyright, 1939, by Houghton Mifflin Company.

[26] W. C. Ruediger, "The Indirect Improvement of Mental Functions through Ideals," *Educational Review*, 36:364–371 (1908).

G. Hendrickson and W. H. Schroeder, "Transfer of Training in Learning to Hit a Submerged Target," *Journal of Educational Psychology*, 32:205–213 (1941).

A. I. Gates, *Generalization and Transfer in Spelling*. Bureau of Publications, Teachers College, Columbia University, 1935.

G. Katona, *Organizing and Memorizing*, Chapters III and IV. Columbia University Press, 1940.

which will facilitate the transition to algebra. He should be taught that the findings of science all group themselves into related systems of generalizations. He should be taught that concentration of attention, analysis, and discrimination are useful habits of mind that he can use in all the situations which he encounters. In short, he should be taught by every possible device to see the advantages of generalization. Generalization is another name for the relating of experiences in such a way that what is gained at one point will redound to the advantage of the individual in many spheres of thought and action.[27]

Transfer value of various school subjects. It was said earlier that study content, especially on the secondary level, too often has been justified on the basis of its disciplinary value. The extent of the transfer effect of certain subject areas will be referred to in Part VI on *Psychology of Learning Areas.* The most pertinent investigations of subject matter transfer include many areas of learning. Two studies were made by Thorndike and his assistants (one reported in 1924 and the other in 1927) that dealt with the transfer effects of various subjects on the high school level.[28]

The purpose of these studies was to determine to what extent a year's study in various subject matter fields would effect improvement in response to tests of "selective and rational thinking." In each study, tests of mental ability were administered to the subjects of the experiment at the beginning of the school year. The first study included 8,564 pupils in grades IX, X, and XI; the second study included 5,000 pupils. The school programs of these more than 13,000 boys and girls were so arranged that the year's program differed only by one subject, for example, Latin for chemistry. At the end of the year's study, another mental ability test was administered in order to determine to what extent improvement in reasoning as measured by performance on this second test could be explained in terms of a year's study in a specific subject area.

The investigations were carefully organized and administered. Moreover, a system of weightings was employed in order to

[27] Judd, *op. cit.,* p. 514.
[28] For a description of these experiments see E. L. Thorndike, "Mental Discipline in High School Studies," *Journal of Educational Psychology,* 15:1–22, 83–98 (1924); and C. R. Broyler, E. L. Thorndike, and E. Woodyard, "A Second Study of Mental Discipline in High School Studies," *Journal of Educational Psychology,* 18:377–404 (1927).

overcome any differences in data that might result from such factors as normal mental growth during the year, possible practice effects from the first test and differences in gain between boys and girls. Below are presented the combined results of the two studies that indicate the relative effect upon development in reasoning of a year's study in ten subject matter areas:

SUBJECT	RELATIVE EFFECT OF TEST GAINS
1. Algebra, geometry, trigonometry	2.99
2. Civics, economics, psychology, sociology	2.89
3. Chemistry, physics, general science	2.71
4. Arithmetic, bookkeeping	2.60
5. Physical training	0.83
6. Latin, French	0.79
7. English, history, business, drawing	0.00
8. Stenography, cooking, sewing	−0.14
9. Biological sciences, agriculture	−0.48
10. Dramatic art	−0.48

As reported in H. L. Kingsley, *The Nature and Conditions of Learning*, p. 544. Copyright, 1946, by Prentice-Hall, Inc.

The above data represent the average amount by which the various subject groups exceeded or fell below those in group 7 (English, history, business, drawing). It can be seen that there was relatively little transfer difference in "general power to think" among the so-called disciplinary subjects — Latin, higher mathematics, and arithmetic — and the more "practical" subjects — physical training, cooking, shop and drawing.

Commenting upon the results of these investigations Thorndike says, "The differences are so small and the unreliabilities are relatively so large that the influence of the subject studied seems unimportant." [29] And again he says, "After positive correlation of gain with initial ability is allowed for, the balance in favor of any study is certainly not large. Disciplinary values may be real and deserve weight in the curriculum, but the weights should be reasonable." [30]

Transfer and mental ability. The greater the degree of mental alertness of the learner the more likely he is to transfer the results of his learning experiences to his behavior in new

[29] E. L. Thorndike, *op. cit.*, p. 95.
[30] *Ibid.*, p. 98.

situations. Adaptability to novel components of a situation is accepted as evidence of mental acuity. However, since a background of experience is necessary if one is to adapt himself with any degree of success to a new situation, transfer of learning and intelligence are closely associated.

The results of Thorndike's studies of mental discipline in high school substantiate this fact. He found that the brightest made the greatest average gain (about 20 points), and that the slowest showed the least average gain (1.5 points). Other investigations in this field have yielded generally similar results.[31]

Comment. Laboratory and classroom investigations of the transfer effect of learning conducted with children and adults have taken the form of experimental studies dealing with many areas of learning. As a result of these studies it may be concluded that transfer — either positive or negative — does take place. Similarity between the learning situation and the situation in which the results of learning are applied, and the extent to which generalizations assist in meeting specific experiences, are significant factors. In their review of studies of transfer reported from 1917 to 1930 Pressey and Janney came to the following conclusions:

(1) Much that has been attributed to special types of education is really the result of selection. (2) When transfer occurs it is not general but specific, and may be described as involving "common elements." (3) The common elements may include methods of attack, attitudes, or points of view, as well as elements of content. (4) Methods of instruction are an important factor bringing about transfer. (5) Though transfer occurs, training directly in a skill or ability appears always to be more efficient than training in another ability plus transfer to the ability it is desired to improve.[32]

Continued experimentation and investigation may yield more detailed information concerning specific transfer value. However, the evidence available is of considerable value to educators as they plan and organize learning opportunities for young people.

[31] See F. D. Brooks, "The Transfer of Training in Relation to Intelligence," *Journal of Educational Psychology*, 15:413–422 (1924). H. A. Carroll, "Generalization of Bright and Dull Children, A Comparative Study with Special Reference to Spelling," *Journal of Educational Psychology*, 21:489–499 (1930); and K. C. Pratt, "Intelligence as a Determinant of the 'Functional' Value of Curricular Content," *Journal of Educational Psychology*, 29:44–49 (1938).

[32] From S. L. Pressey and J. E. Janney, *Casebook of Research in Educational Psychology*, p. 366. Copyright, 1937, by Harper and Brothers.

TRANSFER AS AN EDUCATIONAL OBJECTIVE

Transfer and the curriculum. Many modern school people tend to stress the need of making education practical and utilitarian. School curriculums should be so constructed that their aims and content are closely associated with the day-by-day interests and needs of the learner. The traditional curriculum with its apparent stress upon the disciplinary value of subject matter mastery would be cast aside completely by some in favor of curriculums based almost entirely upon experience. Correlated and core curriculums are attempts at centering learning in broad interest areas rather than departmentalizing it into narrow and unrelated subject fields. There is value in these relatively recent curricular trends. The learner should be helped to adjust to his present life as well as to prepare for meeting his future needs. However, it would be impossible to set up enough different situations in the classroom so that each individual learner would experience, under controlled conditions, every situation in which he will participate either now or later.

If the curriculum is to be practical, it must make provision for the transfer to out-of-classroom situations of knowledges, skills, and habits acquired in the classroom. Subject matter should be chosen in terms of the learner's present and future needs. To the extent that traditional curriculum content will be of value to the individual it should be included in the school's offerings, not for mental discipline but as a basis of generalization.

Curriculum content should be related directly to vocational interests; health and safety needs; and citizenship, home, social, and recreational activities. The subject matter of study, no matter how it is organized, should point toward a way of life, the fundamentals of which are mastered in such a way that the learner can apply them progressively in his various life experiences.

Transfer and teaching methods and attitudes. Some incidental transfer may be expected to occur in most learning, especially as the components of the learning experience happen to be present in other life situations. However, if transfer is desirable, the teacher must aim for it either directly or in-

directly. Identical components should be identified and relationships pointed out.

Every teacher should be aware of what constitutes habits of good scholarship and desirable personal attitudes, and should encourage their realization. Good classroom organization and method, and an understanding attitude on the part of the teacher usually have carry-on or carry-over effects. The knowledges, skills, attitudes, and ideals that will have value for the learner should be decided upon, generalized, and applied in as many real-life situations as are possible. Pupil participation in these situations should not be a result of teacher compulsion but an outgrowth of the learner's personal interest in them and his recognition of their value. Orata emphasizes this fact when he says:

Do we want transfer, and if so, what, in terms of ideals, attitudes, beliefs and habits, do we want transferred; and what provision should we make in method of learning and teaching, administration and the like, in order to bring about transfer in the form and amount we desire? . . . First, the teacher should know what it is that she wants the children to transfer to other fields; second, she must learn by experience or experiment how to teach for transfer, and third, to go ahead and do it.[33]

If habits of good scholarship and desirable attitudes toward work and human relationships are to be learned, to persist, and to become a part of the life pattern of the learner he himself must be guided toward wanting to develop them.

Attention must be directed constantly toward the similarity that exists between school and out-of-school experiences. Meaning, understanding, and useful generalization should become a part of all teaching. The learner should be helped to develop a point of view toward his present and future out-of-school living that will enable him to adapt to the demands of that living.

In his attempt to effect transfer, the teacher is concerned with (1) the techniques that are to be used in thinking, especially in problem solving, (2) effective learning procedures, and (3) methods of dealing with controversial issues. Since attitudes and ideals are important influences in the determination of the extent of transfer that may be achieved, they should be developed in such a way as to effect transfer from classroom situations to the specific life activities of the learners. It is the teacher's function to strengthen learners' generalized behavior controls.

[33] From P. T. Orata, "Transfer of Training and Educational Pseudo-Science," *The Mathematics Teacher*, XXVIII: no. 5: 278, 281 (1935).

In its broadest connotation, all of education should partake of the nature of transfer. Why does an individual go to school? The child may answer that he is forced to do so by the will of his parents and the enforcement of compulsory school attendance laws. Unfortunately, there are young people who "escape" from school as soon as they are legally of age to do so. The writers have heard too many adolescents insist that the subjects they were taking had absolutely no value for them. Perhaps some of the subjects did not. Their content may have been so far removed from the interests and life needs of these young people that there was little if any opportunity for the learners to apply what they had learned to out-of-school situations. Perhaps, too, the difficulty lay not in the content itself but in its method of presentation.

Interestingly enough, some teen-agers who leave school because of their dissatisfaction with what it has to offer them return later to study what they earlier repudiated. Other young people who remain in school and complete their "course" for reasons other than their appreciation of its worth to them, find in later years that they have learned and have been able to apply in their living experiences learning materials which at the time of study seemed valueless. Often these individuals comment upon their school experiences in words to the effect that they wish they could relive their school years so that they might receive from their study all the benefits which were possible of attainment but from which they neglected to profit.

Yes, transfer of training is a fact. But it is the responsibility of school people with the aid of psychologists to continue investigations concerning what transfer is most valuable and what means are most effective for its achievement. More than that, learners should be guided in their learning in such a way that they themselves will come to recognize the extent to which learning in any one area is related to, and can improve, learning in another area, or can aid them in adjusting successfully to present and future life demands.

QUESTIONS AND TOPICS FOR DISCUSSION

1. State the value to a learner of the study of Latin from the point of view of the theory of (*a*) formal discipline, (*b*) identical components, (*c*) generalization.

2. Differentiate, with examples, among the transfer of (*a*) knowledge, (*b*) skills, (*c*) habits, (*d*) attitudes.

3. Discuss the relationship that exists between faculty psychology and the theory of formal mental discipline. Why is this theory now generally discredited?

4. Critically evaluate the statement: "All education partakes of the nature of transfer."

5. Differentiate among (*a*) generalizations, (*b*) habits, (*c*) attitudes, (*d*) ideals.

6. What is meant by *putting meaning* into learning content?

7. Compare education on the elementary school level with education on the college graduate level from the point of view of general transfer.

8. In which subject areas is transfer through generalization most likely to occur? Justify your answer.

9. What is meant by maximum of transfer? What is the teacher's responsibility in connection with it?

10. Discuss this statement: "For practical purposes, all learning should be highly specialized."

11. Evaluate the transfer values of the subject matter area which you are preparing to teach.

12. Explain and illustrate the statement: "The higher the intelligence quotient the greater will be the amount of transfer of learning."

13. From your own experiences give examples of transfer of training. Indicate whether the transfer was by way of identical components or generalization.

14. Would you have the right to expect that the student who ranks first in a course in ethics would be the most ethical member of the class? Justify your opinion.

15. Compare rote learning with logical learning from the point of view of transfer effects.

16. In what ways might rules in spelling, grammar, arithmetic, etc., be considered generalizations? How should rules be taught?

17. Review the subjects which you studied in high school. From which ones have there been the greatest transfer effects to your present subjects of study? Justify your answer by means of specific data.

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Part V

EVALUATION OF LEARNER ACHIEVEMENT

To some adults past school experiences appear in retrospect to consist of little more than the doing of homework and the taking of tests. Any such evaluation of education, of course, is not generally true to fact. Education is concerned with desirable development toward adjusted living. If this development is to be adequate and adapted to individual ability to progress steadily in the educative process, an evaluation of past learning is needed as a basis for continuance of learning. Hence, measurement is a vital component of the teaching-learning process. In PART V are considered the present status of educational evaluation, the objectives to be served by it, the techniques to be employed, and the applications to be made.

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NATURE AND SCOPE OF EDUCATIONAL EVALUATION

Present-day philosophy of education lays emphasis upon the adjustment of the whole individual — physically, mentally, emotionally, and socially. It is therefore important that educational outcomes reflect broad educational objectives. It no longer is possible or desirable to limit school instruction merely to the direction of subject matter mastery or skill proficiency. Rather must attention be given to the adjustment of the individual to the many interactions that constantly are taking place between him and the factors and forces of his environment.

BASIC PRINCIPLES OF EVALUATION

Scope of evaluation. Evaluation of pupil achievement connotes an accurate appraisal of the benefits to him of his formal schooling. Learning success cannot be evaluated only through the administration of teacher-prepared tests that consist almost exclusively of a verbatim recital of memorized material. Whether or not the learner has profited from his school experiences must be judged in terms of the power of adaptation to present and future life requirements that he has achieved as a result of his learning experiences. Hence, an evaluation of learning outcomes includes (1) the measuring or estimating of learner progress by means of carefully prepared and correctly administered techniques, and (2) the accurate recording and interpreting of the resulting data.

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Areas of evaluation. Interpreted broadly, educational evaluation includes evaluation not only of pupil progress but also of curricular offerings, of school organization, of teaching techniques, and of educational outcomes. For the purpose of this treatment attention is directed in this and the chapter that follows toward a consideration only of the first of these various forms of educational evaluation — that of pupil evaluation. Evaluation of the learner includes a study of all aspects of his development, such as: physical development, general mental ability and specific aptitude, interests and attitudes, emotional status, social adjustment, environmental background or conditions, and achievement in school learning.

However, as Ross warns:

It is well to observe that measurement is always a means to an end, and never an end in itself. A measurement is simply a quantitative description of observed data. The significance or educational implications of the measurement are rarely self-evident or automatic. As a rule, the true significance of the measurement can be determined only when it is seen in relation to other relevant factors, and is fitted into the total pattern of the situation.[1]

Further, according to Ross,

It must be recognized that recent tendencies in education have enlarged its scope and increased its complexity, and have thereby added to the difficulties of teaching and administration. But nowhere have these difficulties been more apparent than in the problem of measurement. The need for proper evaluation is as great in the modern school as ever before, but the difficulties of providing for it are vastly greater.[2]

If the evaluation of the results of learning is to be functional it must take into account two general factors:

1. *The differing potentialities that a learner brings with him to a learning situation.* Physical health, mental ability, emotional status, interests and needs, and home and social environments, as these are reflected in the learner's attitudes and habits, all constitute the foundations upon which are built through the media of formal and informal education whatever knowledges, skills, habits, and attitudes the individual eventually will achieve.

[1] Reprinted by permission of Prentice-Hall, Inc., from C. C. Ross, revised by J. C. Stanley, *Measurement in Today's Schools*, Third Edition, p. 18. Copyright, 1941, 1954, by Prentice-Hall, Inc.
[2] *Ibid.*, p. 24.

2. *The social and economic requirements of the world of affairs, for active participation in which the learner is being prepared.* Society has set certain standards of behavior and attitude which hold for all people regardless of their place or function in this society. In addition to these fundamental behavior patterns, the learner must be fitted to meet the demands of whatever particular functions he may be expected to serve in the society of which he is a member — his home obligations, his vocational duties, his citizenship responsibilities, and his recreational and social activities.

As learning experiences are geared to the general and specific needs and interests of the learner and of society, so must evaluation of the results of these learning experiences be aimed at discovering accurately and completely the extent to which learning potentialities and learning materials and procedures synchronize. Guidance in learning requires that the learner's strengths and weaknesses be discovered, and that provision be made for the further strengthening of his already strong characteristics and the elimination or modification of those that are weak or undesirable.

Evaluation must be continuous from the child's entrance into school throughout his entire school life, no matter how far it may extend. Learner evaluation is more than measurement, although certain conditions or products of learning readily adapt themselves to the administration of precise educational yardsticks, i.e., number of words spelled correctly or knowledge of number combinations. Evaluation of educational outcomes has a broad connotation which includes not only appraisal in the narrow meaning of the term but also the interpretation of measuring results and recommendations based upon these results as they apply to life situations.

Evaluation and the teacher. In his daily associations with his pupils, the teacher, consciously or unconsciously, constantly is evaluating them. This more or less unconscious evaluation of a learner during the course of a school term or a school year may have an emotional basis. Teachers, being human, have their likes and dislikes. In light of his own interests, biases, or prejudices a teacher may react toward a particular pupil somewhat in the manner of, "I do not like thee, Dr. Fell — the reason why I cannot tell." Similarly, a teacher may be attracted toward a

pupil because of certain "halo" effects of which the teacher him-self is scarcely, if at all, aware.

These emotional or personal reactions of a teacher toward his pupils cannot be regarded as evaluation in the strict connotation of the term, and may result in much harm both to the learner and to the teacher. The well-trained, objective, emotionally controlled, and understanding teacher, on the other hand, has many opportunities during his association with his pupils to engage consciously in sound, constructive evaluation. Through observation of his pupils' responses during recitation, their general classroom behavior, their attitudes toward him and their fellow classmates, their displayed interests, their habits of work, and other overt expressions of their personal characteris-tics, the watchful teacher can obtain many concrete data of evaluation.

Such relatively informal appraisal needs to be supplemented, however, by more formal instruments of evaluation (described later). After the results are interpreted, those teaching tech-niques are then applied that may be expected to assist the learner to progress to the best of his ability toward the achievement of purposeful educational goals.

Evaluation and school administrators. One of the chief func-tions of a school administrator in cooperation with his teachers is the selection of curriculum materials in light of the needs and interests of learners. The administrator, then, must understand clearly (1) what in the way of learner potentiality he has to start with, (2) where he expects to go in terms of educational goals, and (3) how best he can achieve desirable objectives through organization of school procedures, curriculum selection, and instructional techniques. Thus, for the administrator, evalu-ation of pupil potentiality and progress, of educational objectives, of curriculum content, of teaching effectiveness, constitutes a comprehensive and continuous administrative responsibility.

Evaluation and the learner. Much of the learning in which an individual engages is incidental, achieved almost without his recognizing the changes that are taking place within him. A psychologist known to the authors was wont to say to his students, "You will never be the same after this class meeting." Every experience through which an individual passes leaves a residuum of knowledge or a changed attitude.

However, as the child, adolescent, or adult sets about consciously to participate in one or another learning situation, he is motivated more or less definitely to bring about within himself certain changes that shall be of value to him and to others. If the learner is to make satisfactory progress he needs to know "from what to what" he is progressing. He further needs to compare his rate and amount of progress with those of his peers. He needs help in evaluating his power to achieve and the degree of success that he has attained. To the extent that a learner is enabled to evaluate his own behavior, attitudes, habits of work and study, and subject matter achievement, he can be encouraged to participate intelligently in learning experiences.

SCOPE OF PUPIL EVALUATION

Evaluation of physical and health needs. School administrators and teachers as well as community health agencies recognize the importance of the physical aspect of education. The teacher on any school level is alert to the physical and health needs of his pupils. In the elementary school, simple health and cleanliness inspection is a daily classroom practice. Gross physical defects are recognized and provided for. Visual and auditory defects can be and often are detected by the teacher, as well as signs of communicable diseases. Rogers has this to say concerning teacher evaluation of the physical condition of pupils:

The committee on legislation of the White House Conference on Child Health and Protection urged the training of teachers for the detection of signs of communicable disease and of gross physical defects . . . the ability of the teacher in this field "is the keystone of medical inspection." There can be no substitute for such service, for the appearance of communicable disease in a schoolroom does not await the coming of a physician or nurse, and no one is in such a position of vantage for observing any lapse of the child from a condition which seems, for him, normal.[3]

No matter how alert a teacher may be, he probably should not be held responsible for a complete evaluation of the health of his pupils. Hence in most school systems provision is made for periodic medical examinations of pupils, with recommenda-

[3] From J. F. Rogers, *What Every Teacher Should Know About the Physical Condition of Her Pupils.* U. S. Office of Education, Pamphlet 68. Government Printing Office, Washington, D. C., 1936.

tions for treatment and follow-up. Such evaluation of health and physical condition is given legal sanction in most states.

Evaluation of mental ability and special aptitude. It is generally agreed that all curriculums and teaching techniques should be adapted to the needs of individual learners so that each learner may achieve learning success to the maximum extent of his ability to profit from instruction. It is important, therefore, that a learner's participation in learning experiences be preceded by an evaluation of his potential ability to master learning content or to develop proficiency in a particular form of learning. Evaluation of individual readiness for further learning on increasingly higher levels is becoming a common practice in our schools and colleges. Since the measurement of general intelligence and special aptitudes is discussed in Chapters 8 and 9, no further reference will be made at this point to these aspects of evaluation.

Personal and social evaluation. Too great emphasis cannot be placed upon the need of the school's assuming responsibility for the personal (including emotional) and social development of children and young people. The educational program for adjusted living must comprise a constant process of evaluating, training, re-evaluating, and more training. During this process of evaluation, school people are coming more and more to realize that personality adjustment is not only a necessary objective of education for life in general but for *school life* in particular. The child who is nervous, asocial, aggressive, or shy and retiring cannot obtain the maximum of benefit from his learning experiences.

So strong is the general belief in the importance to the learner of emotional and social adjustment that considerable attention is given throughout this book to these more or less personal phases of evaluation and training. Consequently, any detailed treatment of these aspects of personality at this point would be no more than a duplication of what appears in other chapters.[4]

Evaluation of environmental background and conditions. The influences that are present in the home, the school, and the community constitute educational media that may stimulate or retard desirable development. Quoting from an earlier book by the authors:

[4] See especially Chapters 6, 7, 10, 13, 27, and 28.

"An individual may inherit a more or less adaptable nervous system, but what he does with it is the result of his education. A child is not born with specific emotional controls, demonstrated superiority in any particular field, or appreciation of his rights and responsibilities as a member of a group. He is not born moral or immoral, religious or atheistic. An individual's attitudes and modes of behavior all grow out of continuous interactions between his inherited tendencies and potentialities and those environmental influences by which he is stimulated." [5]

An evaluation of the environmental conditions by which the individual is affected attempts to discover *causes* for pupil attitudes and behavior rather than to appraise attitudes and behavior. Studies of the environmental conditions to which children are exposed yield data concerning the behavior of children that have predictive value for research studies in child development.

Many investigations have been conducted to determine the factors of adjustment or maladjustment that are inherent in home living. The results of these studies seem to indicate that parents' attitudes toward each other and toward their children, tensions in the home, broken homes, and poverty have definitely undesirable effects upon children's attitudes and emotional behavior.[6] Some of the other environmental factors that have been evaluated from the viewpoint of their effect upon young people include the radio, motion pictures, comics, general economic conditions, and teacher attitude.[7]

[5] From L. D. Crow and A. Crow, *Introduction to Education*, p. 132. American Book Company, New York, 1954.

[6] See B. W. Hattwick, "Interrelations Between the Pre-School Child's Behavior and Certain Factors in the Home," *Child Development*, 7:200–226 (1936). D. W. Baruch, "A Study of Reported Tension in the Interparental Relationships as Coexistent with Behavior Adjustment in Young Children," *Journal of Experimental Education*, 6:187–204 (1937). E. A. Curtis and C. L. Nemzek, "The Relation of Certain Unsettled Home Conditions to the Academic Success of High School Pupils," *Journal of Social Psychology*, 9:419–435 (1938). W. A. Kerr and H. H. Remmers, "The Construction and Validation of a Group Home Environment Scale," *Proceedings of the Indiana Academy of Science*, 50:201–206 (1941). M. L. Risen, "Relation of Lack of One or Both Parents to School Progress," *Elementary School Journal*, 39:528–531 (1939). P. M. Symonds, *The Psychology of Parent-Child Relationships*, D. Appleton-Century Company, New York, 1939.

[7] See J. J. DeBoer, "Radio and Children's Emotions," *School and Society*, 59:369–373 (1939). E. Dale, *Children's Attendance at Motion Pictures*, The Macmillan Company, New York, 1935. R. C. Peterson and L. L. Thurstone, *Motion Pictures and Social Attitudes of Children*, The Macmillan Company, New York, 1933. R. Strang, "Why Children Read the Comics," *Elementary School Journal*, 43:336–342 (February,

Certainly, in a case of severe pupil maladjustment the home and community influences to which the child has been exposed should be examined carefully. Many cases of pupil maladjustment could be prevented if more were being done to evaluate by means of objective instruments of appraisal the major environmental factors which may be expected to exercise an undesirable influence upon a child. In a recent classroom discussion of case studies conducted by one of the authors, a student became vehement in his expressed opinion that it should be the responsibility of the school to evaluate home and community conditions for every pupil enrolled in a school. Fortunately an increasing number of school people are engaging in projects of this kind.

Evaluation of school achievement. Attempts to measure learning progress are not of recent origin. Ever since there have been schools, teachers have tried to determine, through oral recitation, written tests, or actual performance in certain skills the extent to which teaching and study have resulted in mastery. Too often the results of the measurement have failed to yield an adequate appraisal of the learning that supposedly had taken place. For example, a student in a college class in statistics admitted that she had never fully understood or mastered the operations employed in the extraction of square root, although in high school she had been considered to be a better than average student in mathematics.

Before the outcomes of general or specific learning experiences can be evaluated, there must be a clear understanding of the objectives which are to be realized through instruction. Not only should these objectives reflect individual and social needs and interests and be stated simply and definitely, but teaching should be aimed at their achievement. Finally, the techniques of evaluation must be so constructed that they yield adequate measures of what has been learned. Several examples can be cited to illustrate what is meant by clearness and definiteness of objectives in instruction and evaluation. Learning to read is a complex activity. The fundamental purpose of silent reading is the obtaining of thought from printed or written material.

1943). J. H. Collins and H. R. Douglass, "The Socio-economic Status of the Home as a Factor in Success in the Junior High School," *Elementary School Journal*, 38: 107–113 (1937). R. H. Ojemann and F. R. Wilkenson, "Effect on Pupil Growth of an Increase in Teacher's Understanding of Pupil Behavior," *Journal of Experimental Education*, 8:143–147 (1939).

Instruction in reading is concerned with (1) the accuracy or completeness of understanding that which appears on the page — *comprehension* of reading content, and (2) the degree of speed with which the individual reads — *rate* of reading. Comprehension and rate of reading each represent a form of learned behavior that must be evaluated separately, before the relationship between the two can be ascertained. For instance, it may be found through the administration of measurement techniques that one learner is quick and accurate in his reading, another is slow but accurate, another is quick but fails to comprehend what he has read, while a fourth is both slow and lacking in comprehension.

Again, it is generally accepted that writing instruction should stress the two general elements — speed and quality. Quality as applied to penmanship includes the specific elements of letter and word spacing, letter formation, slant and quality of line. For handwriting to be legible, attention must be directed toward the perfecting of each of these specific elements of quality. Evaluation of writing also must be specific in terms of the immediate objective to be achieved. Many illustrations similar to the above could be cited.

In the Eight-Year-Study of pupil preparation in high school for college entrance conducted by a commission appointed for this purpose by the Progressive Education Association (now the American Education Fellowship), ten general objectives were formulated. These were utilized by the members of the commission as they attempted to evaluate the educational progress of secondary school pupils who were the subjects of the investigation. The objectives included:

1. The development of effective methods of thinking.
2. The cultivation of useful work habits and study skills.
3. The inculcation of social attitudes.
4. The acquisition of a wide range of significant interests.
5. The development of increased appreciation of music, art, literature, and other aesthetic experiences.
6. The development of social sensitivity.
7. The development of better personal-social adjustment.
8. The acquisition of important information.
9. The development of physical health.
10. The development of a consistent philosophy of life.[8]

[8] From E. R. Smith and R. W. Tyler, *Appraising and Recording Student Progress*, p. 18. Copyright, 1942, by Harper and Brothers.

For the purpose of measuring pupil behavior on the basis of any one of these general objectives, the instructional material and techniques of instruction were broken down in terms of the specific objectives of the various subjects studied by the high school pupil.

The remainder of this chapter is concerned with the appraisal of achievement on the various educational levels. This statement should not be interpreted to imply that aspects of educational development other than the mastery of subject matter as such can be disregarded. Instruction in any subject area should be conducted in such fashion that the learner gains more than a mere body of factual material or skill proficiency. Materials of instruction should be broad and comprehensive as well as specific and detailed, and should touch every aspect of the learner's personality. Evaluating techniques, likewise, should be aimed at discovering the learner's progress (1) in subject matter mastery, (2) in power to understand the significance of and to apply the materials learned, and (3) in growth in attitude and social competence. However, the gaining of a body of specific subject matter and the development of definite skills are basic to the achievement of broad educational objectives. Hence it is important that certain details be mastered and the degree of their mastery measured.

A BRIEF HISTORY OF ACHIEVEMENT EVALUATION

Traditional methods of evaluation. For many generations, pupil progress was measured through the utilization of teacher-made and often subjectively marked examinations of the essay type. The learner usually was asked to describe, compare, discuss, evaluate, or reproduce exactly that which had been learned. Pupil performance varied in the interpretation of questions, and teacher evaluation gave evidence of differences among teachers in the interpretation of answers.

Several investigations in this field and the experience of teachers called upon to grade uniform examinations substantiate the fact that raters tend to vary by many points of credit in their evaluation of answers to the same essay questions. In one such study of two final examination papers in first year English, as rated by 142 teachers of first year English, the range of scores

assigned one paper was from 64 to 98. The second paper was assigned a failing mark by twenty-six teacher raters and a mark of 90 or above by fourteen.[9] In another investigation, a final examination in mathematics was rated by 118 teachers of mathematics. The same examination paper received ratings that ranged from 28 to 92.[10] In a third study it was found that twenty-eight English teachers who graded an English composition and then regraded it after an interval of two months varied considerably in their own evaluations from one grading to another.[11]

If we accept the evidence of studies of this kind, it can be concluded that for education to be continuous and progressive, evaluation of pupil achievement at any stage of learning must be objective and accurate. Measurement techniques must be free or relatively free of the subjective elements of the more traditional types of examinations that are almost certain to interfere with reliable evaluation of learning progress.

Early attempts at objectifying evaluation. The psychologists of the nineteenth century made commendable strides in the development of techniques for measuring the results of sensory stimulation. These efforts reached their peak in the establishment in the University of Leipzig (1878) by Wilhelm Wundt of a laboratory for the experimental study of psychology. Reaction time experiments, as these were conducted by Wundt, Cattell, and others, yielded results that were applicable to certain areas of teaching. For example, the discovery that simple words are reacted to as quickly as letters exerted an important influence upon methods of teaching reading. However, little was done until the end of the nineteenth century in formulating or attempting to formulate standardized and objective techniques of evaluating the outcomes of teaching.

The contribution of J. M. Rice. J. M. Rice, superintendent of schools in Baltimore and editor of the *Forum*, had studied in Germany and had acquired a great admiration for scientific methods as applied in fields other than education. He conceived

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[9] D. Starch and E. C. Elliott, "The Reliability of Grading High School Work in English," *School Review*, 20: 442–457 (1912).

[10] D. Starch and E. C. Elliott, "The Reliability of Grading Work in Mathematics," *School Review*, 21: 254–259 (1913).

[11] C. E. Hulton, "The Personal Element in Teachers' Marks," *Journal of Educational Research*, 12 : 49–55 (1925). See also C. C. Ross and J. C. Stanley, *Measurement in Today's Schools*, Third Edition, Chapter 2. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1954.

the idea that educational outcomes might be evaluated according to more scientific procedures.

Rice had given much time to the study of the work of some of the more important school systems in America and believed that it might be desirable and possible to compare the relative value of different teaching procedures in an area of learning that would lend itself to accurate measurement. As a result, he prepared a list of fifty spelling words in the form of a test which was administered in twenty school systems to approximately 16,000 children. With the test Rice sent to the various school superintendents a questionnaire to be answered by the teachers of the participating children concerning methods of teaching spelling.[12] Although there was much criticism of Rice's work among psychologists and schoolmen, he persisted in his studies of testing techniques in various school subjects. His point of view and his attempts at test construction became a starting point in the development of objective testing techniques as an aid to improved teaching methods.

The influence of Thorndike. Prior to the twentieth century and even during the early part of this century, *perfection* was the generally accepted goal of teaching. Failure to achieve perfection or near perfection was assumed to mean that the teacher could not teach or the children would not learn. This attitude began to be modified when, in 1909, Thorndike proposed that the quality of penmanship be measured by a handwriting scale rather than by set standards. As the result of a compilation of selected samples of handwriting of children on respective learning levels, he devised a scale consisting of samples of handwriting to each of which was given a numerical value statistically determined and representative of the norm of performance for each grade level respectively. No longer, for example, did a teacher of the fourth grade need to strive for perfection of handwriting. Rather would he compare the handwriting of a pupil with the sample on the scale which was nearest to the performance of the learner and thus determine whether or not the pupil was above or below grade standard.[13]

[12] See J. M. Rice, "Futility of the Spelling Grind," *Forum*, XXIII (April and June, 1897).

[13] See E. L. Thorndike, "Handwriting," *Teachers College Record*, XI:93 (March, 1910).

During this same period, two of Thorndike's students experimented with measurement in arithmetic. C. W. Stone concentrated upon the construction of two tests for sixth-grade pupils — one based upon the four fundamental operations and the other dealing with problem solving. The Stone Reasoning Test resulted from his work.[14]

Meanwhile S. A. Courtis, working with Stone, began the construction of tests in arithmetic for grades three through high school. The Courtis Arithmetic Tests that resulted from his study have been used widely in the schools of the country.

Later developments. Stimulated by the efforts of these early pioneers and responding to an increasingly recognized need on the part of school people for more and better measuring instruments, a wealth of measuring techniques has been devised for use on all school levels and for all subject areas. These measuring techniques will be discussed further in the next chapter. Perhaps it may not be amiss to add here that at present so many are the available tests and so thoroughly convinced are most educators of the value of many of these objective instruments of measurement that it might be desirable at this point to evaluate critically the work that has been done in this field as a means of improving what already has been accomplished.

USE AND MISUSE OF EVALUATING TECHNIQUES

Performance in life situations. It probably is an indisputable fact that the best measure of an individual's success in learning is his ability to apply what he has learned to actual life situations. When we call upon a physician to diagnose a health difficulty or to treat us when we are ill, we do not first check the marks which he received in medical school as a result of examinations. We do select, however, one physician rather than another because we believe that, as a result of his success with his other patients, he will be able to help us. Parents and children do not evaluate a teacher in terms of the marks achieved by him in his preparation for teaching but rather as a result of his actual classroom effectiveness and attitudes.

In our day-by-day activities we tend to evaluate individual

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[14] See C. W. Stone, *Arithmetical Abilities and Some Factors Determining Them.* Contributions to Education, No. 19. Bureau of Publications, Teachers College, Columbia University, 1908.

ability to perform on the basis of the product produced. We judge a woman's proficiency in cooking not on the fact that she may have won honors in a course in home economics but in terms of our enjoyment of the well-planned and tasty meals which she prepares. We evaluate a person's citizenship attitudes in light of his behavior as a citizen, not as a result of the fact that he "knows all the answers" on written examinations that deal with citizenship responsibility.

The real test of learning achievement is successful practice. However, while learning is taking place, it is not always possible or desirable to place the learner in situations in which he can display in a practical fashion the mastery of what to that point he has achieved. Hence, other techniques of evaluation — usually of the paper-and-pencil variety — must be utilized.

Uses of evaluating techniques. Imperfect as measuring techniques still may be, they have educational value in that through their utilization both the teacher and the learner are enabled to discover the extent to which the direction of learning effort has been effective, so that new learning can be based upon that already mastered. Progress in subject matter achievement is a fundamental educational goal. Yet other objectives are equally important, since the extent of a learner's knowledge and skill competence is not the sole determiner of successful living.

Many evaluating tools and techniques have been devised, some of which can be applied by the classroom teacher. Other evaluating instruments should be administered by trained persons who are skilled in the methods of test administration and in the interpretation of results. Those special techniques that are intended to discover subtle personality attributes should be used only by psychologists and psychiatrists.[15]

If well-constructed instruments of measurement or techniques of evaluation that reflect carefully formulated learning objectives are administered accurately, and their results interpreted intelligently, they can be made to serve laudable purposes. Performance on an examination stimulates the interested learner toward further accomplishment. It helps him to discover the important elements of his study and wherein he has

[15] See J. W Wrightstone, J. Justman, and I. Robbins, *Evaluation in Modern Education*, copyright, 1956, by American Book Company.

succeeded or failed. Relearning on the part of the learner in terms of his weaknesses is thus made possible.

Further, by means of measuring devices and the interpretation of results, a teacher is aided in his diagnosis of the individual weaknesses of his pupils and can adapt his teaching to them. In addition, measuring instruments (such as aptitude tests) can be used to discover pupil capacity and stage of learning readiness.

Misuse of evaluating techniques. With the increase of interest in the measuring movement there arose during the 1920's a wave of testing that appeared to be done for its own sake rather than for the benefits that learners and teachers could derive from the testing. It became the fashion for entire school systems, schools, or learning areas within schools or school systems to subject learners to a barrage of measuring techniques. Much time, money, and energy went into these activities. The results were tabulated and then filed for future reference. In many instances these testing projects had little or no effect upon the current teaching or learning procedures.

In other instances, the material contained in measuring instruments was the basis of teaching in preparation for their administration. An amusing story is told of a fifth-grade teacher who, when Ayres Spelling Scale first was adopted as a means of measuring progress in spelling, carefully drilled her pupils in the spelling of the words for her grade so that all her pupils would have a perfect score when the test was administered. Not too different from this procedure is that of some high school teachers in New York State who still devote much time to the mastery of the material of previous Regents Examinations in preparation for a forthcoming Regents Examination. A similar attitude is displayed by some high school teachers throughout the country in "preparing" their students for college entrance examinations.

The utilization of instruments of measurement should be an important part of teaching and learning. Such techniques can serve many purposes. Lee and Segel give the following as purposes of tests as tools of evaluation:

Teachers use tests for a variety of purposes. There is very little agreement, however, in any specific uses. There are only two uses to which more than 50 per cent of the teachers subscribe. These are, "To aid in determining the pupil's marks" and "To discover what parts of a topic

need to be retaught." These results show that there may be a need for school administrators to emphasize the uses of test results. Some of the more important uses of tests in the secondary field, in addition to the two mentioned, are: (*a*) to discover the approximate quality of work each pupil should do; (*b*) to discover what topics or units need to be taught; (*c*) to stimulate pupils to do better work (through furnishing information to the pupil regarding his achievement); (*d*) to evaluate strengths and weaknesses of instruction; (*e*) to aid in determining the future educational program of the pupil; and (*f*) to classify pupils into equal ability groups.[16]

If learning is to be evaluated in terms of educational objectives that are desirable, measurement techniques utilized for this purpose must be well formulated and thoroughly understood, valid and reliable, carefully administered, intelligently interpreted, and of practical value to all concerned with learning processes and outcomes. The next chapter is concerned with a discussion of the factors of measurement that deserve consideration if evaluating programs are to serve the purposes for which they are intended.

QUESTIONS AND TOPICS FOR DISCUSSION

1. List some of the values that you have experienced from participation in programs of measurement.
2. Differentiate between general and specific educational objectives.
3. Discuss the relationship that should exist between educational objectives and the content of examinations.
4. Evaluate the traditional essay type of examinations. Cite examples of your own experience with them.
5. List learning outcomes that do not adapt themselves readily to paper-and-pencil measurement.
6. Give advantages and disadvantages of comprehensive examinations.
7. Explain why teachers vary in their rating of answers to essay questions. If possible, have the members of your class rate an answer to an essay question. Discuss findings.
8. To what extent should teacher success be evaluated in terms of the results of pupil measurement?
9. Name and explain at least four different functions that can be served by techniques of evaluation.

[16] From L. M. Lee and D. Segel, *Testing Practices of High School Teachers*, p. 38. U. S. Office of Education, Bulletin No. 9, 1936. Government Printing Office, Washington, D. C.

10. Review the chapters on *Intelligence*, *Aptitudes*, and *Personality*. How is the evaluation of these aspects of development related to the measurement of achievement in learning?

11. Evaluate the point of view of the student in education who would have a study made of every learner's environmental background.

12. In what ways can the use of measuring instruments affect the curriculum or teaching procedures of a particular school or school system?

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TECHNIQUES OF EVALUATION

T HE preceding chapter stressed the importance of utilizing techniques of evaluation that can be expected to measure responses in light of instructional objectives. If this purpose is to be achieved, the evaluating devices must be constructed (if they are teacher-made) or selected (if they are standardized tests or scales) so that the results obtained from their administration are of practical value in building new learning upon the old. No matter how carefully the instrument of evaluation is constructed or selected, however, little of value can be expected to result from its utilization unless it is administered correctly, the resulting data interpreted objectively and intelligently, and the data utilized in terms of the purpose for which the test was administered.

A complete and comprehensive consideration of all the methods of evaluation that can be employed, with a detailed description of the many such instruments now available, belongs rightfully in a book that deals only with educational evaluation and measurement. In this chapter, therefore, are presented only those fundamentals of evaluating techniques that have shown themselves to be psychologically sound as a result of investigation and experimentation.

OBJECTIFYING INSTRUMENTS OF MEASUREMENT

Types of objective tests. Granted that the traditional essay question usually is indefinite in its wording, varies in its scope, and lends itself to subjective scoring, efforts have been made to

offset these weaknesses through the construction of simple, quickly and easily answered forms of questions, in the marking of which the subjective element is eliminated or very greatly reduced. Included among the so-called short-answer types of tests are: true-false tests, multiple-choice or multiple-response tests, completion tests or tests of simple recall, matching tests, identification or cross-out tests, and modified essay-type questions.

True-false tests. The true-false test consists of a list of statements, each to be rated in terms of its relative truth or falsity. Whether the statement is true or false usually is to be indicated by "T" or "F," "Yes" or "No," + or −, or + or 0. The subject places the identifying letter or symbol that represents his judgment either in front of the statement or in a column arranged for that purpose at the right of the page. A few examples are presented below.

(1) *Directions:* Place a plus sign (+) in front of each statement that is true or essentially true; otherwise place a zero (0).

____1. The function of a teacher is to guide his pupils toward competent self-development and subject-matter mastery.

____2. Guidance, except in cases of serious maladjustment, is undesirable since it tends to develop an attitude of dependence rather than independence on the part of the person guided.

(2) *Directions:* At the right of the page next to each statement place a "T" if you think the statement is true or correct, or an "F" if you think the statement is false or incorrect.

1. Columbus discovered America in the fourteenth century.   ——

2. The Pilgrims settled on the eastern coast of America.   ——

In some forms of true-false tests the letters T and F appear at the right of each statement and the subject encircles, crosses out, or underlines the letter which he thinks more nearly describes the statement.

True-false statements can be answered easily and quickly and can be scored by means of a key. However, great care must be taken that the wording of the statement is so clear and definite that the meaning is not debatable. Also, the constructor must be careful to avoid a rhythm of trueness and falseness of the statements, i.e., T, T, F, F, or T, F, T, F. Tiegs lists some of the

difficulties that may be encountered in the construction cf true-false tests as the following:

1. Confusion in instructions in both oral and written forms.
2. Balancing the numbers of true and false items in each test.
3. Making statements which are partially true and partially false, or neither true nor false, or indeterminate.
4. Using too long and involved statements.
5. Using words or expressions which serve as clues to correct responses.
6. Using too many negatives, double and single.
7. Utilizing technical or obscure language.
8. Stating personal opinions or making broad, meaningless generalizations.[1]

In order to eliminate the factor of chance, the test should consist of at least 50 statements (or, better still, 100). Further, since "guessing" may lead to the chance marking of statements correctly, some users of this type of test apply what is referred to as the *chance correction formula:*

$$\text{Score} = \text{Number Right minus Number Wrong}$$

Many test users believe, however, that the application of this formula may penalize the pupil whose response represents knowledge rather than chance guessing. Some require that the subject justify in a brief statement on the test paper his reasons for marking a statement false. However, to the extent that opinion enters into the rating of the reason given, the subjective element thereby is introduced.

Multiple-choice test. The multiple-choice test also is referred to variously as the multiple-response test, the best-answer test, or a test of changing alternatives. Regardless of what it is called, usually three or more words, phrases, or sentences are presented in this type of test from among which the best or most logical item is to be selected. The item of choice may be indicated by underlining, crossing out, entering the letter or number of the selected item on a line to the left or right of the page, or crossing out, encircling, or underlining the letter or number to the right of the item that corresponds with that of the selected item.

[1] From E. W. Tiegs, *Tests and Measurements in the Improvement of Learning*, p. 81. Copyright, 1939, by Houghton Mifflin Company.

(1) *Directions:* Place in the margin to the left the letter of the word or phrase that indicates the best answer.

----1. A child who blames his teachers and his tests for poor marks is illustrating what is known technically as (*a*) obsession, (*b*) projection, (*c*) daydreaming, (*d*) irrational ideas.

----2. The factor that is of least significance in affecting the amount of transfer of training value is (*a*) the subject studied, (*b*) the method employed, (*c*) the intelligence of the learner, (*d*) the presence of identical elements.

(2) *Directions:* Read each question carefully. Then place a cross (**X**) on the letter in front of the statement that best answers the question.

1. Boys and girls should drink
   a. tea
   b. milk
   c. coffee

(3) *Directions:* After each question there are four answers, of which only one is correct. In the parenthesis after each question put the number of the correct answer.

1. Little Boy Blue was told to   1. blow his horn
   2. mind his brother   3. chase the cows   4. waken the
   birds.   ( ) 1.

(4). *Directions:* In each question ONE answer is correct. Place a cross (**X**) on the letter in the answer column at the right of the page which represents the best answer.

1. Huckleberry Finn was a friend of   (*a*) Uncle Tom
   (*b*) Robinson Crusoe   (*c*) Tom Sawyer   (*d*) Abou
   Ben Adhem   *a b c d* 1.

The multiple-choice question is popular with most test users. As with the true-false test, the question must be so worded that there will be no ambiguity of meaning. Care must be taken, also, that no answer is too farfetched or patently wrong. There should be gradations of possible correctness so that the subject is challenged to choose that item which is the *best* answer. Unless tests of this type are well constructed, two of the possible answers may be appropriate. The question should be so worded that the subject would not be tempted to mark two answers, as in this example:

1. The finest horses are bred in   (*a*) Arabia   (*b*) Spain   (*c*) Kentucky   (*d*) Russia

Further, there may be difference of opinion concerning the *best* answer, as in the following:

1. The curriculum should place greatest emphasis upon (*a*) subject-matter mastery (*b*) skill development (*c*) habit formation (*d*) attitude direction.

The completion test. In this form of test, words or phrases are omitted which are to be supplied. The form of the test may range from a simple sentence in which only one word is omitted to paragraphs in which there are many omissions which need to be filled in so that the meaning of the paragraph is clear.

(1) *Directions:* Fill in the correct word in each blank.
1. The capital of Ohio is _____.
2. _____ is the author of "Alice in _____."

(2) *Directions:* Fill in each blank so that the meaning of the sentence will be clear.
1. It is generally agreed that _____ curriculums and teaching _____ should be _____ to the _____ of individual learners so that _____ learner may achieve learning _____ to the _____ extent of his ability to _____ from instruction.

In the more involved completion exercises the subject may fill in words that give a meaning to the sentence or paragraph that is different from what the tester expected. Before you continue reading, fill in the blanks of the last question above. Now turn to page 352 of this book and check your sentence with the original. How do the two differ and to what extent have you changed the meaning of the sentence from what was intended? How much credit should you receive for your interpretation?

There must be a nice balance of cues that will serve as directors of thinking if the completion test is to be truly objective and easy to score. The scoring of a question of this kind should not be restricted to complete adherence to the words or phrases of the key, since logical reasoning, not rote memory, should be measured.

The matching or association test. Two columns of data are presented in the matching or association test. Each item in one column is associated in meaning with an item in the other column. The subject is expected to enter next to each item in the

one column the letter or number of an item in the other column that is most closely associated with it.

(1) *Directions:* In Column B each name listed is that of a person who was living at the time that an event happened in American history that is listed in Column A. In the parentheses after each name in Column B place the number of the event in Column A that is associated with the name.

COLUMN A	COLUMN B	
1. Writing of "The Star-Spangled Banner"	*a.* George Dewey	( )
	b. John Smith	( )
2. The Civil War	*c.* George Washington	( )
3. The Second World War	*d.* Robert Fulton	( )
4. Founding of Quebec	*e.* Ulysses S. Grant	( )
5. Spanish-American War	*f.* Douglas MacArthur	( )
6. The coming of the Pilgrims	*g.* Miles Standish	( )
7. The writing of *Sleepy Hollow*	*h.* Francis Scott Key	( )
8. Louisiana Purchase	*i.* Paul Revere	( )
9. The invention of the steam-boat	*j.* Washington Irving	( )
10. The Battle of Lexington		
11. The settlement of Jamestown		
12. The inauguration of the first President of the United States		
13. The settling of Rhode Island		

(2) *Directions:* In the margin to the left of each term in Column I, place the *number* of the term in Column II that is most nearly associated with it.

COLUMN I	COLUMN II
____ economy in learning	1. measure of agreement
____ motives	2. blaming others for personal faults
____ multiple-choice question	
____ E. L. Thorndike	3. learning by generalization
____ Gestalt	4. endocrine gland
____ E.Q.	5. spelling test
____ Ebbinghaus	6. Spearman
____ Seashore	7. theory of identical elements
____ thyroid	8. evaluating technique
____ A. O. Heck	9. steps in reflective thinking
____ activity program	10. affective experiences
____ Charles Judd	11. investigations on memory
____ anecdotal record	12. objective measurement

---- G and s factors of intelli- 13. derived from inner urges
    gence

14. tests of musical ability

---- William James

15. providing for individual dif-
    ferences

---- coefficient of correlation

---- J. M. Rice

16. configuration

---- projection

17. whole and part methods

---- John Dewey

18. the education of exceptional
    children

---- attitudes

19. derived score of measurement
20. excusing undesirable behavior
21. early experiments in transfer
    of training
22. study of bright and gifted

In order to increase the difficulty of association, more items usually are placed in one column than in the other. Sometimes the subject is expected to identify two items in one column with one in another. Care must be taken that cues are not offered through the wording of the items. For example, in (1) above *Captain* John Smith would act as a cue as would also *Admiral* George Dewey. Plural and singular forms of nouns and verbs also may serve as cues.

Other types of short-form tests. Ingenious test constructors sometimes modify one or another of the types of tests presented above in such manner that an element of challenging change of response is introduced. For example, knowledge of chronological sequence without undue emphasis on actual dates can be discovered through a question like the following:

(1) *Directions:* Arrange the following events in their order of happening by placing 1 in front of the first one that happened, 2 in front of the second, and so on.

> Invention of the sewing machine
> Discovery of electricity
> Invention of the first steamboat
> Invention of the incandescent lamp
> Invention of the cotton gin

Another form of question that has to do with precision of meaning is illustrated in the following:

(2) *Directions:* Place an S before each of the following pairs of terms if they refer to essentially the same thing and a D if they refer to things that are quite different.

```
____  1. motive — purpose          ____ 13. aptitude — talent
____  2. configuration — connec-   ____ 14. verbalism — lip service
          tion                     ____ 15. reflective thinking —
____  3. test — scale                       problem solving
____  4. reciprocal learning —     ____ 16. average — mediocre
          transfer                 ____ 17. concept — idea
____  5. validity — reliability    ____ 18. central tendency —
____  6. norm — standard                    range
____  7. insight — understanding   ____ 19. mental age — educa-
____  8. dispersion — deviation             tional age
____  9. diagnostic — prognostic   ____ 20. eye-voice span — recog-
____ 10. character — personality            nition span
____ 11. maturation — learning
____ 12. individuation — differ-
          entiation
```

Objectifying the essay-type question. In order to eliminate the element of subjectivity in an essay-type question, attempts have been made to word the question in such a way that by specific directions the pupil is guided in his organization of his answer to the question. The rater of the question then scores the answer in terms of the adequacy of treatment. The wording of the answer is not considered, but attention is directed to its thought or content. For example:

(1) At least three causes have been given for the outbreak of the Civil War. In a brief sentence for each, state three of the causes.

    a.

    b.

    c.

(2) "The elementary school has an excellent opportunity for helping a child to develop desirable attitudes."

  1. Name four of these attitudes.

    a.

    b.

    c.

    d.

  2. Explain briefly what the school can do in the development of two of the attitudes you have listed.

    a.

    b.

test would not yield an accurate measure of the speed of response of the unusually quick and able pupil.

Some material, such as social studies or the physical sciences, does not lend itself easily to speed-test construction since it may be difficult to equate the items of a test so that all of them will be of the same degree of difficulty. This equating has been done for testing speed in arithmetical computation. Tests of speed in reading also have been constructed that yield relatively satisfactory results.

Quality or power tests. The purpose to be served by these tests is not concerned primarily with the rate at which a pupil can work (although many of them are timed tests) but rather with the quality of his performance or the extent of his power to perform.

The material of these tests is arranged progressively by equal steps of difficulty from easy items to relatively complex items. Such tests sometimes are referred to as *performance* scales. Other forms of these measuring instruments include the *quality* scale exemplified in the Thorndike Handwriting Scale, referred to in the previous chapter. The teacher evaluates the quality of a pupil's performance by comparing it with the progressively graded quality levels on the scale. The *product* scale can be utilized for learning fields in which skill is emphasized, such as penmanship, sewing, and drawing. The Ayres Spelling Scale is a quality scale, but it differs somewhat from the usual quality scale in that it contains lists of words or quality levels of approximately equal difficulty for each school grade respectively. By administering the words of a selected column to a class and by comparing individual results with the grade norms for that column, a teacher can discover the spelling grade reached by each pupil in terms of the number of words spelled correctly.

Classification of standardized tests according to function. A standardized test may be intended to serve one of several functions: (1) survey, (2) diagnosis, (3) prognosis. A brief description of tests serving each of these functions follows.

Survey tests. These tests are constructed to cover a wide area of learning content, and are useful as instruments for measuring the total performance of an individual in a given field of knowledge, or of comparing the performance of group against group or the group against itself. Survey tests are used extensively in order to discover the relative extent of achievement in given

learning areas of different schools within a system or school district, or to measure achievement against the standardized norms for the tests. These tests also are utilized for comparison of pupil progress in whole school systems as compared with other school systems.

A teacher may find it helpful to evaluate the progress of his pupils in a given area of learning during the course of a term or a year by means of survey tests. One form of a selected standardized test is used at the beginning of the term's or year's work, and another form of the same test at its completion.

Diagnostic tests. As the term implies, tests of this kind are designed to discover or diagnose specific learning difficulties of pupils. In a well-constructed diagnostic test emphasis is given to a specific aspect of the learning of a particular subject so that each pupil's strengths and weaknesses may be discovered and remedial teaching applied. For example, in a test of arithmetic reasoning, questions may be so formulated that pupil skill in arithmetic fundamentals, interpretation of the questions, and knowledge of procedure may be tested respectively.

Diagnosis as a test function probably has been most successful in yielding data concerning specific difficulties in progressive stages of learning.

Prognostic tests. Here again the term itself represents the function of these tests, which is that of yielding a measure of prediction or prognosis as to a learner's expected success in a field of learning in which he has not yet participated, or has done so only slightly. Much of the aptitude testing referred to in Chapter 9 is of this type.

EVALUATION OF STANDARDIZED TESTS

Reasons for evaluating. The administration of tests and testing programs is time- and money-consuming. Unless the results obtained from such a project are worth while, in that the results can be utilized as bases of improved teaching and learning, the energy and money expended could be used to better advantage.

In the selection of a test or tests to be administered, certain criteria of evaluation should be applied. Those usually considered are the test's validity, reliability, ease of administration, adequacy of norms, and meaningfulness of interpretation.

Validity. A test is said to be valid if it measures what it is supposed to measure. Validity rests for the most part upon the selection of the items which are included in the test, although other criteria may be applied. According to Remmers and Gage, standardized achievement tests can be validated in terms of criteria with which test content and test scores are compared.

In validating a test by means of content, the criteria may include the analysis of textbooks, courses of study, and teachers' final examinations; formulated objectives of instruction; opinions of competent judges; social utility; and analysis of mental processes. The validation of a test in terms of test scores would imply the utilization of the following criteria: regular school marks; likeness or difference of performance as indicated by the scores made by groups showing wide differences in ability; progression in success, in terms of percentage, from grade to grade or age to age; extent of agreement with the results of other tests; and ratings given to pupils by teachers and other competent raters.[3]

Since validity is not an absolute characteristic, several kinds of validity may be identified, depending upon the purpose for which the evaluative method is to be used. . . . These are *predictive validity, concurrent validity, content validity,* and *construct validity.*
. . . Predictive validity is judged or estimated by the degree of the relationship between a measure and subsequent criterion measures or judgments.
. . . Concurrent, or status, validity indicates the correspondence, or relationship, between a measure and the more or less immediate behavior or performance of identifiable groups.
. . . Content validity is judged by the degree of relationship or correspondence between a measure or diagnostic technique and achievement in the specific course or curriculum.
. . . Construct validity may be established by indicating the correspondence or relationship between the results of a technique of measurement and other indicators of the characteristic or characteristics that are measured or assessed.[4]

[3] See H. H. Remmers and N. L. Gage, *Educational Measurement and Evaluation*, Revised Edition, pp. 197 ff. Harper & Brothers, 1955.
[4] J. W. Wrightstone, J. Justman, and I. Robbins, *Evaluation in Modern Education*, pp. 43–45. American Book Company, 1956.

Reliability. By reliability is meant the extent to which, or the accuracy with which, a test measures what it has been constructed to measure. A test can be invalid in that it does not measure what it is supposed to measure, but at the same time it can be considered reliable if it measures *accurately* what it does measure. If a test yields the same results each time it is administered, it may be said to be reliable for those items.

There are several statistical methods of computing reliability. A consideration of these methods is not pertinent to this discussion. Consistency of results is the important element of reliability. If the rank order of scores changes materially from one administration of the test to the next with the same or similar groups of pupils, the test has little value as an index of individual achievement.

Ease of administration. This is a practical consideration in the selection of testing material. Other things being equal, i.e., the validity and reliability of the tests, that test or battery of tests to be selected for use should be chosen in terms of (1) general make-up of the test — size of print, arrangement of material, space for answering; ease of handling test booklet, etc.; (2) time needed for administration; (3) clearness, simplicity, and definiteness of directions for administering; (4) ease of scoring; (5) adequacy of interpretation; (6) lowness of cost.

Norms and interpretation. The ultimate value of an instrument of measurement lies in its interpretability. The number of items correctly answered, commonly referred to as raw scores, has little meaning unless results can be interpreted in comparison with the performance of other pupils on the same test. For this reason authors of tests supply a table of norms that present the to-be-expected performance of the average pupil on a specific age or grade level. For example, the norm for the fifth grade on a test may be 52 items correct out of a possible 90, and 63 items for the sixth grade. A teacher, however, should not be satisfied to have his pupils center about average performance. In order to help teachers to set standards, norms sometimes are presented in the form of percentile ranks, thus allowing for a more refined interpretation of individual performance. For example, a pupil in the fifth grade who earns a score of 85 out of a possible 90 might be in the 95th percentile and a pupil with a score of 52 in the 50th percentile.

a low E.Q. may depend upon one or more of the following factors: degree of intelligence, efficacy of teaching, grade placement, home and environmental conditions, and personal interests.

Accomplishment quotient. In order to obtain a numerical relationship between a pupil's ability to learn and his learning achievement, another derived score is employed — the accomplishment quotient (A.Q.), sometimes called the accomplishment ratio (A.R.). Other factors being equal, a child's intelligence quotient and his educational quotient should be similar. For example, a child with an I.Q. of 120 should have an E.Q. of 120 or thereabouts. This is not always the case, however. A pupil may have an I.Q. of 125 and an E.Q. of 100. His accomplishment quotient then would be computed according to the formula:

$$A.Q. = \frac{E.Q.}{I.Q.} \times 100.$$

Substituting,

$$A.Q. = \tfrac{100}{125} \times 100 = 80.$$

By dint of perseverance, hard study, and extreme interest, a pupil whose I.Q. is 90 may achieve an E.Q. of 117, which would earn for him an A.Q. of 130, as determined by the formula given above.

The assumption here is that the pupil's educational success or lack of it is determined by his degree of intelligence. The practical school person well knows that many factors other than native intelligence may be responsible for a pupil's degree of success in school achievement. These factors include quality of teaching, physical condition, opportunities for home study, kind of study habits, and out-of-school interests or responsibilities. Hence the accomplishment quotient should be used cautiously as an index of a pupil's educability.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss the advantages and disadvantages of the essay type of question.
2. Why should a true-false test consist of more than fifty items?
3. Compare the relative merits of E.Q. and A.Q. as a means of evaluating a pupil's learning status.

4. The multiple-choice type of test probably is the most widely used short-form test. Give reasons for this.
5. Discuss some of the weaknesses of the completion type of test.
6. Why may the short-form test be inadequate as a means of measurement in learning areas that deal with controversial issues?
7. What is meant by "bluffing" in an essay-type examination? How does this differ from "guessing" in a true-false test?
8. State the values and weaknesses in comparing learning progress in two school systems through the administration of the same achievement test.
9. Distinguish between speed tests, survey tests, and diagnostic tests. State briefly the value of each to the teacher.
10. Differentiate among: intelligence tests, aptitude appraisal, evaluation of personality traits, and measurement of learning achievement.
11. Show how the teacher can use the results of these different instruments of evaluation in adapting teaching to individual needs.
12. What is meant by validity and reliability as applied to tests and test material? How and to what extent can the validity of a teacher-made test be determined?
13. As a class project, construct objective-type tests for the material contained in PART V of this book. Include all types of questions.
14. As the result of your own experience, what seems to be the attitude of teachers toward the use of standardized tests?
15. In what areas of individual development would observed behavior yield more accurate results than paper-and-pencil tests? Why?
16. List at least five cautions that should be observed in the construction of a teacher-made test.

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20

SIMPLE STATISTICS IN EDUCATION

Every teacher should possess a working knowledge of simple statistics. Although the classroom teacher probably will have little occasion to utilize statistics as a tool of research itself, he should be acquainted with statistical terminology and know how to apply simple statistical procedures to teaching-learning results. An understanding of the fundamental principles of statistics enables teachers to evaluate more intelligently the scores that are made by their pupils on tests or examinations.

MARKS RECEIVED BY PUPILS

Pupils' marks — absolute or relative. Educators no longer regard a grade or test mark as an absolute measure of a pupil's achievement. Concerning the scores, marks, or grades that are earned by learners, it is now believed by many that such values represent *relative* achievement. This conclusion is based upon the discovery of many unreliable factors that contribute to the improbability of those measures being absolute values. Among these factors are ineffectual teaching, questions inadequate in content and phrasing, variability of marking standards, little or no objectivity in the evaluation of answers, misuse of scoring key, etc. The result may penalize a learner for teacher inefficiency or examiner failure.

A learner's success or failure is conditioned by the extent of his knowledge and by many factors that are external to himself. Teachers and supervisors should recognize factors such as the relative degree of difficulty of a test, the types of questions that

are used, the methods and standards of scoring that are employed in the rating of the tests, and the interpretation of the mark that is accepted as passing.

Errors other than those connected with the construction, administration, and grading of teacher-made tests are to be found. Even such uniform examinations as those given by New York State (Regents Examination) are not always uniform. As a means of standardizing teaching content and techniques there is value in uniform examinations, but doubts can be raised concerning their value as absolute measures of achievement.

Although, during each individual testing period, all pupils are subjected to a uniform examination in any one subject, the form of the examination may vary in difficulty from one term to the next. The passing mark in the New York Regents Examination, for example, remains constant. The result is that, on a comparative basis, pupils who take what may be a more difficult test earn lower grades on the average than do learners who take an easier test at another time. This fact alone may account for a learner's failing in one examination but passing it when he repeats it. Pupils who happen to be victims of a difficult examination are penalized, not necessarily because of lack of preparation but as a result of the character of the examination.

School leaders have recognized this weakness in the uniform system of examinations and its application from term to term, and have taken steps to correct glaring discrepancies. With an awareness on their part that examination questions cannot be equated in difficulty from term to term has gone a willingness to adjust the passing mark to a lower score if the results of a particular examination indicate a need for such adjustment. This adjustment has been made in several subjects in the Regents Examination during the past few years. The adjustment of passing scores is to be commended. It shows that schoolmen are realizing that an evaluation of performance as expressed in score values is relative rather than absolute.

Aside from the factor of difficulty of questions in a test or examination, there are other significant variables that help to alter the absolute value of marks as measures of achievement in learning. Too often an assigned mark or a grade represents the point of view of the rater. If, as he grades a set of papers, a

teacher is influenced by his personal bias, the results will vary in terms of that point of view rather than according to other more objective standards.

As was noted in Chapter 18, marking standards vary widely among teachers, and a teacher himself may be inconsistent in the marks he assigns. If a teacher is to maintain fairly uniform standards during the marking of a set of essay questions, the entire set of papers should be marked at one time rather than allowing a day or two to intervene between markings. During this time the teacher's standards may change. That great discrepancy exists among raters of essay questions is well exemplified in the following example of the rating of a history paper. A group of experts, in order to objectify their ratings as much as possible, prepared a model paper as a guide for the raters. One rater, who did not know that a model set of answers had been included, rated all the papers according to his own set of standards and rated the model paper as a failure. Both the rating standards used and the point of view held by this rater were responsible for his deviation from the accepted standards of pupil response to the test questions.

Few teachers can be certain that the marks which they assign represent their pupils' actual degree of achievement. It is possible, however, as a teacher learns to use simple statistical procedures that he will be able to evaluate the performance of each learner in light of that of the other members of the group, and thereby make the assigned scores relatively more meaningful. This will enable a teacher also to obtain a better understanding of his own teaching and testing techniques, and to measure pupil achievement in terms of his teaching effectiveness as well as in terms of the achievement of the entire group.

Need of statistics in education. Every teacher knows that the results of the tests which he administers to the same group of pupils during the teaching and learning of any subject differ considerably from learner to learner, and from test to test. If a teacher rates a learner 84 on one test and 62 on another in the same subject, does this represent a difference in learner achievement, or does it indicate that the material of the second test was very difficult or poorly taught, or that the questions were more difficult or the papers less accurately marked? If the scores earned by all the learners on each test are considered as relative in

terms of group achievement rather than absolute in value, greater justice may be accorded to learners.

Recently two tests of unequal difficulty and length were administered to a class in educational psychology. One test consisted of 110 objective questions and the other of 102. The highest score earned by one student in the first test was 85 and the lowest score earned by another was 60. The highest and lowest scores made in the second test were 81 and 54 respectively. However, although these tests were administered to the same students, neither the highest nor the lowest scores were made by the same student in both tests. Since the two tests were of unequal difficulty and length, an absolute evaluation of an individual score on either test would be unfair.

In order that greater objectivity and justice can be introduced into the interpretation of scores on tests or examinations, there have been devised methods of reducing these scores to units of comparison, thereby making it possible to translate them into more nearly correct values. The teacher therefore should know and be able to utilize the devices that have been evolved for his assistance in this connection.

The discussion that follows will be devoted to a brief explanation and illustration of some of the techniques that are more commonly used in simple educational statistics. Some statistical terms are explained, and examples cited of the methods used in dealing with respective statistical concepts. Among the more important statistical terms that should be understood by teachers are: range, frequency distribution, measures of central tendency (mode, mean, median), measures of variability (quartile deviation and standard deviation), normal curve of distribution, and correlation. The terms reliability and validity are explained in Chapter 19.

STATISTICAL TREATMENT OF DATA

In order to illustrate how data can be subjected to statistical treatment for the purpose of interpreting scores in terms of their relative value, actual scores of two tests in educational psychology will be employed in this section. The scores presented in Table I were those earned by 36 college students in what we shall call Test A and Test B respectively. Test A consisted of 104 objective questions; Test B consisted of 120 objective questions. In addi-

tion, there are also presented (in Table II) the *psychological scores* of 25 of the students for whom such scores were available. These scores were secured as a result of the administration of a Psychological Examination (American Council on Education) to entering freshmen. The scores in the two tables are listed according to the students' initials. The latter are arranged alphabetically except for those students for whom no psychological scores were on file.

TABLE I.   *Scores Made by 36 Students in Two Tests in Educational Psychology*

STUDENT'S INITIALS	SCORES IN TEST A	SCORES IN TEST B	STUDENT'S INITIALS	SCORES IN TEST A	SCORES IN TEST B
E. B.	69	78	E. R.	69	85
L. B.	72	86	J. S.	90	87
A. C.	70	90	R. S.	83	90
F. F.	84	85	S. S.	69	76
E. F.	78	88	G. S.	78	86
L. G.	77	87	C. S.	81	88
E. G.	83	80	A. V.	71	87
T. G.	75	85	M. C.	74	90
M. G.	85	92	A. E.	64	88
S. H.	86	89	B. E.	84	80
F. K.	76	84	D. J.	82	86
L. K.	74	82	R. K.	71	87
R. L.	81	84	B. L.	70	85
G. M.	80	81	E. N.	69	75
D. N.	62	82	B. P.	74	86
N. P.	86	90	E. P.	82	90
H. P.	71	86	J. R.	77	88
E. R.	83	86	M. R.	88	88

TABLE II.   *Psychological Scores Made by the First 25 Students in Table I*

STUDENT'S INITIALS	PSYCHOLOGICAL SCORES	STUDENT'S INITIALS	PSYCHOLOGICAL SCORES	STUDENT'S INITIALS	PSYCHOLOGICAL SCORES
E. B.	124	M. G.	126	H. P.	107
L. B.	131	S. H.	143	E. R.	105
A. C.	77	F. K.	117	E. R.	100
F. F.	115	L. K.	104	J. S.	144
E. F.	124	R. L.	100	R. S.	109
L. G.	113	G. M.	125	S. S.	104
E. G.	95	D. N.	110	G. S.	115
T. G.	112	N. P.	106	C. S.	128
				A. V.	93

Frequency (f) distribution. The scores given in Table I and Table II represent the actual number of correct answers for each student and are called *raw scores*. Since they are not expressed as percentages, they have little meaning when considered independently of one another. They do, however, take on added meaning when they are subjected to statistical treatment. The frequency of their occurrence can be determined readily after they are arranged in order of distribution in what is called a *frequency table*. Table III shows the complete distribution of all the scores made on the two tests A and B (ungrouped data); in

TABLE III. *Frequency Distribution of Scores Made in Two Tests in Educational Psychology (Ungrouped Data)*

SCORE IN TEST A	TALLY	FREQUENCY	SCORE IN TEST B	TALLY	FREQUENCY
90	I	1	92	I	1
89		0	91		0
88	I	1	90	IIIII	5
87		0	89	I	1
86	II	2	88	IIIII	5
85	I	1	87	IIII	4
84	II	2	86	IIIIII	6
83	III	3	85	IIII	4
82	II	2	84	II	2
81	II	2	83		0
80	I	1	82	II	2
79		0	81	I	1
78	II	2	80	II	2
77	II	2	79		0
76	I	1	78	I	1
75	I	1	77		0
74	III	3	76	I	1
73		0	75	I	1
72	II	2			
71	III	3		Total	36
70	II	2			
69	IIII	4			
68		0			
67		0			
66		0			
65		0			
64		0			
62	I	1			
	Total	36			

Table IV are presented the same data after they have been grouped in step-intervals of 4 (grouped data).

TABLE IV. *Frequency Distribution of Scores Made in Two Tests in Educational Psychology (Grouped Data)*

	TEST A			TEST B		
STEP-INTERVAL	TALLY	FREQUENCY	STEP-INTERVAL	TALLY	FREQUENCY
90–93.99+	|	1	90–93.99+	⫽⫽⫽ |	6
86–89.99+	|||	3	86–89.99+	⫽⫽⫽ ⫽⫽⫽ ⫽⫽⫽ |	16
82–85.99+	⫽⫽⫽ |||	8	82–85.99+	⫽⫽⫽ |||	8
78–81.99+	⫽⫽⫽	5	78–81.99+	||||	4
74–77.99+	⫽⫽⫽ ||	7	74–77.99+	||	2
70–73.99+	⫽⫽⫽ |	6	70–73.99+		
66–69.99+	||||	4	Total		36
62–65.99+	||	2			
Total		36			

The size of the step-interval of 4 in Table IV is optional, depending on the material involved. Since the scores represent continuous rather than discrete series, a score of 82, for example, extends from 82.0 to 82.99+. Hence the step-interval of 90–93 includes all the values from 90.0 through 93.99+ or 4 steps, and the next interval begins with 94.0. We are using the following interpretation of the value of a score since it is the one more commonly used in psychological and educational statistics; that is, a score of 65.0, for example, stands for all values from 65.0 up to but not including 66.0. (In the tables that follow the decimal (.99) will be dropped.)

Tables III, IV, V, and VI are called tables of frequency distribution or frequency tables. By referring to Table III it can be observed that the scores in Test A distribute themselves from a high of 90 to a low of 62; in Test B the scores do not scatter themselves so widely, having a high of 92 and a low of 75. The difference between the score of the student having the highest score and the score of the student having the lowest score on Test A is 28 points; for Test B it is 17 points. This extent of spread of scores shows the *range* of the scores, or the *number of*

points on a scale that lie between the highest score and the lowest score: $R = H - L$.

TABLE V.   *Frequency Distribution of Scores Made on Psychological Examination (Ungrouped Data)*

SCORE	TALLY	FREQUENCY	SCORE	TALLY	FREQUENCY
144	|	1	114		
143	|	1	113	|	1
142			112	|	1
141			111		
140			110	|	1
139			109	|	1
138			108		
137			107	|	1
136			106	|	1
135			105	|	1
134			104	||	2
133			103		
132			102		
131	|	1	101		
130			100	||	2
129			99		
128	|	1	98		
127			97		
126	|	1	96		
125	|	1	95	|	1
124	||	2	94		
123			93	|	1
122			92		
121			91		
120			90		
119			89		
118			88		
117	|	1	87		
116			86		
115	||	2	85	|	1
			Total		25

The frequency of distribution can be represented graphically through the use of frequency polygons, a form of visual aid to present data. A graph usually helps understanding, since relationships indicated in tabulated data are clarified through it. Figures 24 and 25 are graphic representations of the grouped data for the results of Test A and Test B, and the Psychological

Examination. These frequency polygons are based on the data presented in Tables IV and VI.

TABLE VI. *Frequency Distribution of Scores Made on Psychological Examination (Grouped Data)*

STEP-INTERVAL (6)	TALLY	FREQUENCY
139–144	||	2
133–138		0
127–132	||	2
121–126	||||	4
115–120	|||	3
109–114	||||	4
103–108	⧼Ht	5
97–102	||	2
91–96	||	2
85–89	|	1
	Total	25

NORMAL CURVE OF DISTRIBUTION

Through experimentation it has been discovered that a large and unselected group of phenomena distributes itself according to a definite plan. If the items of the group are arranged in order of size, the least common or the fewest cases will appear at the extremes and the most common or the most frequent at the middle of the distribution. For example, out of 1,000 men selected at random, there will be very few tall men and about an equal number of very short men. The largest number of the group will be about average in height and will fall midway between these two extremes. No matter what human trait is considered, each trait of a large number of unselected persons will be found to distribute itself according to what is called a *normal curve of distribution*. The trait can be any one of the following or any other that might be selected: weight, color of hair, industry, intelligence, etc.

Figure 26 is representative of the way in which any set of these data will arrange itself if a sufficiently large number of unselected cases is measured.

the midpoint in each step-interval. The method is illustrated for Test A in Table VII.

TABLE VII. *Calculation of the Mean (M) (Grouped Data)*

STEP-INTERVAL (4)	X	F	FX	
90–93	92	1	92	Substituting in the formula:
86–89	88	3	264	$M = \dfrac{\Sigma FX}{N}$
82–85	84	8	672	
78–81	80	5	400	$M = \dfrac{2792}{36} = 77.55$
74–77	76	7	532	
70–73	72	6	432	The mean, therefore, is 77.55,
66–69	68	4	272	as based on grouped data.
62–65	64	2	128	
		$N = 36$	$\Sigma FX = 2792$	

The median (Mdn). When scores are arranged in order of magnitude, the median is the midpoint of that array of scores. It is the point above which and below which 50 per cent of the cases fall. In ungrouped data the score that represents the middle of the distribution of students' scores can be used to serve most teacher needs. However, with grouped data the median is found by means of the following formula:

$$Mdn = \frac{N}{2}$$

The method is illustrated for Test A in Table VIII.

TABLE VIII. *Calculation of the Median (Grouped Data)*

STEP-INTERVAL (4)	F	
90–93	1	
86–89	3	
82–85	8	$\dfrac{N}{2} = \dfrac{36}{2} = 18$ cases above or below the point to
78–81	5	be found on the scale.
74–77	7	
70–73	6	$Mdn = 74 + (\frac{9}{7} \times 4)$
66–69	4	
62–65	2	$Mdn = 74.0 + 3.43 = 77.43$
	$N = 36$	

When we divide the number of scores N by 2 ($N = 36$), the quotient is 18. The problem then is to find a point on the scale above which and below which 18 cases fall. By beginning at the bottom of column marked F in Table VIII and counting up 18 cases, we find that the median falls somewhere in the step-interval 74–77. There are 12 cases up to the 74–77 interval. Therefore, in order to get the 18 that are needed we must take 6 of the 7 cases in that step-interval; consequently, we take $\frac{6}{7}$ of 4 (the size of the interval) and add the result to the 74.0, or the beginning of the step-interval. The result is the median, or 77.43. In the same way, find the median for Test B and for the Psychological Examination.

MEASURES OF VARIABILITY

The extent to which cases tend to gather around the average or central tendency, or the extent to which they disperse themselves, is called their *variability*, or *deviation*. If all the members of a group earned the same scores in a test, there would be no variability or deviation in their scores. Likewise, the smaller the amount of deviation, the more alike or homogeneous is the performance of the members of the group. The extent of deviation can be expressed in terms of range, quartile deviation, mean deviation, standard deviation, probable error, or coefficient of variation. For our purposes we shall consider only the *range*, the *quartile deviation*, and the *standard deviation*. Other methods of computing deviation belong rightly in a course in statistics.

Range (R). Range was defined on page 389. However, in a general interpretation, the range represents a measure of variability, since the smaller the spread of a set of scores the more homogeneous the group is likely to be. For example, the results of Test A (range 28) indicate greater variability than do the results of Test B (range 17).

Quartile deviation (Q). Quartile deviation is measured from the median. It represents the average amounts by which the Q_3 (third or upper quartile) and Q_1 (first or lower quartile) deviate from the median. Q_1 is the 25th percentile, the median (Mdn) is the 50th percentile, and Q_3 is the 75th percentile. Q represents the distance on the scale that lies 25 per cent above or 25 per cent below the median, or one-half the distance between Q_3 and Q_1.

Quartile deviation, then, can be found by the use of the following formula:

$$Q = \frac{Q_3 - Q_1}{2}$$

Table IX illustrates how it is computed.

TABLE IX.   *Calculation of Quartile Deviation (Q) (Grouped Data)*

STEP-INTERVAL (4)	F	
90–93	1	$\frac{N}{4} = \frac{36}{4} = 9$ $Q_1 = 70 + \left(\frac{3}{6} \times 4\right) = 72$
86–89	3	
82–85	8	
78–81	5	$\frac{3N}{4} = \frac{3 \times 36}{4} = 27$
74–77	7	
70–73	6	$Q_3 = 82 + (\frac{3}{8} \times 4) = 82 + 1.5 = 83.5$
66–69	4	
62–65	2	$Q = \frac{Q_3 - Q_1}{2} = \frac{83.5 - 72}{2} = 5.75$
$N = 36$		

The first step in the computation of Q is to find the number of cases that are included in the lowest 25 per cent of the cases, or up to Q_1. The number is 9 (or $\frac{1}{4}$ of 36). By counting up from the bottom it is found that the 9th case falls in the step-interval 70–73. It also is discovered that 3 of those cases are required to complete the 9 needed for Q_1. Q_1 falls, then, at 70.0 plus $\frac{3}{6}$ of 4 (step-interval) or at 72, as shown in Table IX. In a similar way, Q_3 is found; $\frac{3}{4} N$ or 27 must be used to discover how many cases are to be counted from the bottom. After Q_3 and Q_1 have been found, it is easy to substitute in the formula to arrive at Q, or the quartile deviation. It should be observed that when 1 Q is laid off in each direction from the median, 50 per cent of the cases are included.

Standard deviation (S.D. or σ). The measure of variability considered to be the most accurate is the standard deviation. It is not difficult to calculate for grouped data by the following formula, if an assumed or guessed mean approximating the actual mean is used. (In the formula, i = size of interval, c refers to the correction for the mean, and D represents the deviation from the mean.)

$$S.D. (\sigma) = i\sqrt{\frac{\Sigma FD^2}{N} - c^2} \qquad c = \frac{\Sigma FD}{N}$$

Table X illustrates the short method. (76 is used as the assumed mean.)

TABLE X. *Calculation of the Standard Deviation (Grouped Data) by Using an Assumed Mean of 76*

STEP-INTERVAL (4)	X	F	D	D^2	FD	FD^2
90–93	92	1	4	16	4	16
86–89	88	3	3	9	9	27
82–85	84	8	2	4	16	32
78–81	80	5	1	1	5	5
74–77	76	7	0	0	0	0
70–73	72	6	−1	1	−6	6
66–69	68	4	−2	4	−8	16
62–65	64	2	−3	9	−6	18
		N = 36			$\Sigma FD = 14$	$\Sigma FD^2 = 120$

Substituting in the formula:

$$S.D. \text{ or } \sigma = 4\sqrt{\tfrac{120}{36} - (\tfrac{14}{36})^2} = 4\sqrt{3.33 - .1513}$$
$$= 4\sqrt{3.18} = 4(1.78) = 7.12$$

This short method of computation is based upon the use of an assumed mean, thus reducing the arithmetic involved in computing the actual mean or in applying an actual mean that includes decimals, 76.99, for example. However, in order to correct for the error between the assumed mean and the actual mean, the correction formula (c) on page 396 is used.

The formula used in finding the standard deviation when the actual mean is used is:

$$S.D. = \sqrt{\frac{FD^2}{N}}$$

Note: Care must be exercised in the application of these formulas. In the illustrations, the point of deviation as expressed in the D column begins with the midpoint (76.0) of the step-interval 74–77. The deviation for this step-interval is 0. All step-intervals above the 74–77 (midpoint 76) deviate up by 1, 2, 3, or 4 step-intervals; and all below deviate down by 1, 2, or 3 step-intervals. However, since an assumed mean of 76 rather than the actual mean of 77.55 (see page 394) was used, the correction formula had to be employed.

of 1 in Test A and a rank of 1 in the other test, a difference in ranks of 0. In Table XI are presented the ranks for each student in each test. From the data in this table we have:

$$N = 25$$
$$\Sigma D^2 = 1615.5$$

Substituting in the formula:

$$\rho = 1 - \frac{6\Sigma D^2}{N(N^2 - 1)}$$
$$\rho = 1 - \frac{6(1615.5)}{25(625 - 1)} = \frac{9693}{15600}$$
$$\rho = 1 - .62$$
$$\rho = .38$$

Product-Moment method. The scores in the same two tests and for the same students will now be subjected to the Product-Moment method. The reader can compare the differences in results obtained by the use of the two different methods. The Product-Moment method of finding the coefficient of correlation between two sets of data is presented in Table XII. It will be noted that the Product-Moment method yields a coefficient of correlation (r) of .42 whereas the Rank-Difference method yields a coefficient of correlation (ρ) of .38. The coefficient of correlation (r) of .42 is more accurate than the ρ of .38, since the actual scores were used rather than rank places of the scores.

In Table XII the scores in the two tests are set down for each of the 25 students. It is easier to find the extent of the deviation of each score from the mean (M), when we select an assumed mean (M'). For scores in Test A, 77 was chosen as M'. The deviation of the scores in Test A are given in the x column. For example, the score made by E. B. is 69 and is 8 points less than 77, hence the deviation is -8. The score made by L. B., 72, is 5 less than 77, hence a deviation of -5 is recorded. In the same way the deviation of each score in Test A is found and placed in the x column. The deviations of the scores from an assumed mean in the Psychological Examination are similarly found. Here 113 was selected as M'. Hence in the y column is placed the deviation of each score from this assumed mean. The score, 124, made by E. B. is 11 higher than 113, hence the deviation of $+11$ or 11 is placed in column y. 131 is 18 higher than 113 and $+18$

or 18 is placed in column *y*. These examples will serve to illustrate how the numbers in columns *x* and *y* were determined.

The numbers in the x^2 column result from obtaining the squares of the numbers in the *x* column. The numbers in the y^2 column are the squares of the numbers in the *y* column. The numbers in the *xy* column represent the algebraic product of the *x* deviation and the *y* deviation for each student.

TABLE XII.   *Computation of Correlation between the Scores Made by 25 Students on Test A and Psychological Examination. (Product-Moment Method)*

STUDENT'S INITIALS	SCORE TEST A	SCORE PSYCH. EXAM.	x	y	x^2	y^2	xy
E. B.	69	124	−8	11	64	121	−88
L. B.	72	131	−5	18	25	324	−90
A. C.	70	77	−7	−36	49	1296	252
F. F.	84	115	7	2	49	4	14
E. F.	78	124	1	11	1	121	11
L. G.	77	113	0	0	0	0	0
E. G.	83	95	6	−18	36	324	−108
T. G.	75	112	−2	−1	4	1	2
M. G.	85	126	8	13	64	169	104
S. H.	86	143	9	30	81	900	270
F. K.	76	117	−1	4	1	16	−4
L. K.	74	104	−3	−9	9	81	27
R. L.	81	100	4	−13	16	169	−52
G. M.	80	125	3	12	9	144	36
D. N.	62	110	−15	−3	225	9	45
N. P.	86	106	9	−7	81	49	−63
H. P.	71	107	−6	−6	36	36	36
E. R.	83	105	6	−8	36	64	−48
E. R.	69	100	−8	−13	64	169	104
J. S.	90	144	13	31	169	961	403
R. S.	83	109	6	−4	36	16	−24
S. S.	69	104	−8	−9	64	81	72
G. S.	78	115	1	2	1	4	2
C. S.	81	128	4	15	16	225	60
A. V.	71	93	−6	−20	36	400	120
	$M = 77$	$M' = 113$	77	149	1172	5684	1558
			−69	−147			−477
			8	2			1081

After the *x* and *y*, x^2 and y^2, and *xy* values are found for each of the scores, each column is added algebraically. (Careful attention should be given to the positive and negative signs.)

These numbers are then substituted in the formula and the computation is completed.

If the actual mean (M) is used, the following formula is applied:

$$r = \frac{\dfrac{\Sigma xy}{N}}{\sqrt{\dfrac{\Sigma x^2}{N}}\sqrt{\dfrac{\Sigma y^2}{N}}} = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \cdot \Sigma y^2}}$$

However, since *assumed means* (77 and 113) rather than actual means were used, the correction formula must be applied. Hence, the Product-Moment formula for computing correlation, including the correction for the mean, is as follows:

$$r = \frac{\dfrac{\Sigma xy}{N} - \left(\dfrac{\Sigma x}{N}\right)\left(\dfrac{\Sigma y}{N}\right)}{\sqrt{\dfrac{\Sigma x^2}{N} - \left(\dfrac{\Sigma x}{N}\right)^2} \cdot \sqrt{\dfrac{\Sigma y^2}{N} - \left(\dfrac{\Sigma y}{N}\right)^2}}$$

Substituting:

$$r = \frac{\dfrac{1081}{25} - \left(\dfrac{8}{25}\right) \cdot \left(\dfrac{2}{25}\right)}{\sqrt{\dfrac{1172}{25} - \left(\dfrac{8}{25}\right)^2} \cdot \sqrt{\dfrac{5684}{25} - \left(\dfrac{2}{25}\right)^2}}$$

$$r = \frac{43.24 - (.32) \cdot (.08)}{\sqrt{46.88 - .1024} \cdot \sqrt{227.36 - .0064}}$$

$$r = \frac{43.2144}{(6.84)(15.07)}$$

$$r = \frac{43.2144}{103.0788} = .4192 \text{ or } .42$$

A coefficient of correlation of .42 is low. It indicates that there was considerable variability in performance in the two tests. Causes of this variability of performance may be found either in the students' attitudes toward subject-matter mastery or in the construction of the tests. It readily can be understood that if every student had earned the same relative scores on the two tests, the correlation would have approached 1.00, or perfect positive correlation.

The coefficient of correlation is a ratio that may extend from perfect positive correlation (1.00) through no correlation (0.00)

to perfect negative correlation (−1.00). Usually, for prediction purposes, a correlation of

.90 to 1.00 is very high
.80 to .90 is high
.60 to .80 is satisfactory
.40 to .60 is low
0 to .40 is very low

It should be noted at this point that another purpose of this brief survey of some of the most commonly used statistical procedures is to help the reader in his understanding of educational literature. Knowledge of statistics has its uses, but knowledge of a few statistical processes does not qualify one to be a statistician. The material presented in this chapter, however, should help a teacher to make a more satisfactory analysis and interpretation of test data than he would be able to do without the use of these statistical techniques.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Which of the simplified statistical methods presented in this chapter is a teacher likely to use most frequently?
2. To what extent are grades a matter of a teacher's philosophy?
3. To what extent do you want the normal curve of distribution applied to the scores made by your class on tests or examinations?
4. Explain why a passing mark of 75 per cent in one school may stand for no higher achievement than a passing mark of 65 per cent in another school.
5. Why is it so difficult to score essay examination papers accurately?
6. Why should a teacher make use of a model answer paper when he marks essay questions?
7. After your class has taken a test in this subject, ask your teacher to give the class all the scores so that they may determine the median, the mode, and the mean of the grades.
8. Arrange the scores of any test on a frequency polygon.
9. Compute the standard deviation of the grouped data of Test B.
10. Compute the correlation between the test results in Test B and the scores made on the Psychological Examination by the first 25 students listed.
11. After you have taken two tests (which you may have done by now), compute the coefficient of correlation between the scores made by the members of the class on the two tests. Use either the Rank-Difference method or the Product-Moment method.

12. The following scores were earned on a test in history:

73 62 91 80 74 83 65 54 93 86 72 80 69 84 90
72 77 81 72 80 64 57 75 79 83 95 54 82 68 92
74 82 88 80 76 86 90

  a. Make a frequency table of these 37 scores.
  b. Arrange the scores from high to low; find the median; rank the scores.
  c. Compute the quartile deviation (Q); and the standard deviation ($S.D.$)

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Part VI

PSYCHOLOGY OF LEARNING AREAS

THERE is a growing tendency in modern education to organize learning material so that its various aspects will be taught and learned in as many lifelike situations as are possible. There are, however, differences in the ways in which learners approach and master the various kinds of learning material to which they are exposed. Further, desired learning outcomes are not the same for all subjects nor is the degree or amount of mastery that can be expected the same for all learners. Hence in the discussion of the various learning areas that are considered in PART VI the psychological factors pertinent to each area are presented briefly. The psychology that underlies mastery in any subject or learning area holds regardless of the organization of the material in terms of existing educational theory and practice, including activity programs, correlated curriculums, core curriculums, or other forms of organization, many of which still are in the experimental stage.

21

ACQUIRING THE TOOLS OF COMPREHENSION AND EXPRESSION

I see the picture (or the word) and I can make it, too," exclaims the small child. "I understand what it is about. I can tell you or write it down," are the words used by the older child. "I comprehend the meaning of this passage (or presentation). I shall summarize it orally or in written form," says the adult.

Above are illustrated in a general way the stages of development of an individual's ability (1) to use the tools of comprehension — the interpretation of the written word (or symbol), and (2) to gain power in giving expression to the comprehension of the material or situation by which he has been stimulated. The power to communicate with other human beings in the environment is a life necessity. The lower forms of animals make their interest known by sounds and various forms of behavior. It is the human being alone who has been able to organize his modes of expression in the form of what is generally referred to as language. Not that human beings do not have other forms of expression such as gestures, facial grimaces, and sounds of various kinds that give vent to emotional reactions or that are used to emphasize the spoken word.

Although the expression phase of development in a very young child follows that of the lower animals in that he coos, cries, and uses body movements as forms of response, he gradually falls into the language pattern of his group. At first this is largely the result of imitation. Later it is a direct outcome of teaching and

learning. In fact, effective learning is dependent upon the progressive mastery of language, which is the tool by which the learner is enabled to master learning content in general.

DEVELOPMENT OF LANGUAGE MASTERY

General connotation. The satisfaction of one's interests, the gaining of experience, and the development of the power to participate in higher forms of thinking and reasoning rest upon the utilization of language. We think in words, we express our thoughts in words — either oral or written. The degree of success which we acquire in the utilization of language expression is closely related to (1) individual potentiality to acquire the tools needed for effective thinking and expression, and (2) teaching efficacy in techniques that will make the acquisition of these tools possible.

The function of language is well stated by Judd:

It [language] is a means of arousing and establishing associations which expand personal thinking so that the mental life of an individual becomes a part of the mental life of a group. All that human experience has achieved in the way of classification of ideas and in the way of methods of dealing with situations can be communicated through language. . . . Language is something more than sounds produced and heard; it is a means of influencing personality. To use language is to change one's mode of thinking. When children learn language, they do not merely learn certain reactions; they absorb and express ideas; they make the experience of others a part of their own mental lives. When they speak, they induce others to share the experiences through which they have passed.[1]

In its general connotation, then, language mastery (either of the vernacular or of a foreign language) includes the interpretation of symbols or words as a means of acquiring thought from written or printed material and oral and written expression — speech, penmanship, spelling, grammar, and composition.

Psychological factors. The urge to understand that by which one is stimulated and the impulse to express oneself are inherent, but the means of interpretation and the manner of expression are closely related to environmental influences. As was suggested earlier, the young child attempts to satisfy his needs

[1] From C. H. Judd, *Educational Psychology*, p. 146. Copyright, 1938, by Houghton Mifflin Company.

through relatively uncontrolled body movements and by way of vocalizations such as coos, gurgles, and crying. As, through maturation, he gains greater control of his muscles — and thus of his vocal cords and the organs of the mouth — his first unintelligible sounds gradually come to take on meaning.

The young child acquires his early language habits largely through imitation of the language patterns of those about him. Gradually he acquires conventionalized forms of expression which are accompanied by enlarged patterns of thought. Because of a mistaken notion concerning a child's power of understanding, adults often indulge in so-called "baby talk." This is a harmful procedure in that through it there may be set up language habit patterns that later are difficult to break.

With increasing growth in the power to perceive and to think, and with enlarging interests aided by stimulating teaching, the child builds up his vocabulary, gives more and more attention to language forms and precision of meaning, gains power to comprehend oral and written language, and develops progressively greater skill in oral and written expression. Moreover, as an integral part of his growth in language skill, he achieves acquaintance with the world about him that should result in clearness of thinking and reasoning.

Hence facility in comprehension and expression passes through progressive stages from a child's first awareness of himself, of his wants, and of the people and things in his environment to the comprehension of logically organized and abstract material. At the same time the growing child also develops habits of expression that begin with simple responses and may result eventually in oral or written language patterns of a logically minded and brilliant orator or writer.

Individual differences in language ability. The development of the language arts has been a fertile field for study on the part of psychologists and educators. Many experimental investigations have been conducted for the purpose of discovering the psychological factors that underlie relative success or failure in language mastery. The experienced teacher recognizes the fact that pupils differ widely in their power to comprehend written material and in their ability to express themselves adequately.

Intelligence is a factor of prime importance. The power to gain meaning from words and to put meaning into them varies

with the mental alertness of the individual. Other factors also are significant. Upon his entrance into his formal school learning activities, the child brings with him habits that have resulted from his preschool home background. The influences of his home environment not only affect his early patterns of thought and expression but, to the extent that these influences persist in the home, they continue to facilitate or to retard his further progress. If the home background is rich in culture, the child has a decided advantage over the product of a meager home where language expression is crude and incorrect and family life represents little more than a struggle for existence.

Good physical constitution, as this is related to healthy and satisfactory adjustment to experiences, accompanied by normal curiosity about people and things, helps in the development of desirable language habits. Apathy, timidity, and lack of confidence, as these are outgrowths of poor health, physical defects, and meager experiential background, interfere with the desirable development of comprehension and expression.

Educational objectives and teaching techniques also influence the child's language development. The teacher himself must serve as a model of language habits worthy of imitation. Every lesson should be a language lesson. Too often, especially on the secondary and college levels, the instructor in a subject field other than "English" either is not alert to the language difficulties of his students or appears to believe that mastery of the facts or processes of subject content — not mode of expression — is of primary importance. Competence in any area of learning depends in great part upon the learner's ability to think clearly, and to express himself fluently and precisely. By recognizing superior language skill and helping to improve weaknesses, and by providing socialized recitations, dramatic productions, and intelligently conducted contests in written expression, regardless of the subject field, teachers make it possible for all school experiences to partake of the nature of language study.

The development of language skills. In the following brief treatment of the various phases of language, reference will be made only to factors that are basic to the gaining of power in comprehension and skill in expression. A more detailed analysis of the psychological factors of language development belongs rightly in a comprehensive study of the psychology of school

subjects. Although each specific area of study dealing with comprehension and expression through language will be considered separately, it must be kept in mind that an individual's language skills do not develop in isolation, but are interrelated and are acquired concurrently.

DEVELOPING SKILL IN SPOKEN LANGUAGE

Importance of spoken language. What a person says, why he says it, and how he expresses his thoughts in oral form constitute those aspects of personality that earn for him either the respect and admiration of his fellows or destructive criticism, amusement, or contempt. From young childhood onward, therefore, an individual should be helped to acquire correctly expressed and meaningful patterns of oral communication. This becomes a special responsibility of parents and teachers. Reference has been made to the influence of the home upon the early language habits of a child. Teachers serve a dual function. They must be able to recognize speech difficulties that grow out of pathological or psychological disorders as well as be alert to inadequate speech resulting from badly formed habits.

Teacher trainees sometimes become impatient of the attention that is given to the development of good speech patterns among candidates for teaching. School children as well as preschool children are great imitators. Hence not only are teachers expected to be alert to the speech habits of their pupils but through their own speech patterns and vocabularies they also must be able to stimulate their pupils toward acquiring a richly meaningful and correctly articulated vocabulary, and accurate grammatical arrangement of words, phrases, and sentences. The child tends to repeat what he hears. As far as possible, he should hear only the best in oral expression and should be helped to understand what he hears. The accurate repetition of memorized material, such as grammatical rules or scientific principles, may be no more than a kind of parrot-like performance, unless meaning is attached to the words used so that they become an integral part of the learner's thinking process. To be truly effective the gaining of skill in spoken language is a complex process that necessitates the mastery of the mechanics of speech, the acquisition of an increasingly large and abstract vocabulary, and skill in sentence structure and paragraph organization.

Stages in language development. Oral expression begins in the "screaming period" of the infant. During this time the infant's sounds represent emotional reaction rather than mental activity. Next comes the babbling stage, beginning at about the third or fourth month of life. The young child gradually becomes aware of his surroundings and attempts to respond to people and things about him with sounds that at first are unintelligible but later take on meaning. Ma-Ma and Da-Da usually are the first recognizable "words" and are associated by fond parents with their child's recognition of their relationship to him.

With the increasing growth of his speech organs and of the workings of the mental processes, the young child, encouraged by his elders, learns to utter words that are related directly to the satisfaction of his wants. Hence he may say "ball" by which he means "I want the ball." The use of nouns alone as forms of oral expression later is supplemented by the addition of adjectives, for example, "good boy," "bad doggy." When the child acquires the ability to phrase his thoughts in the form of simple sentences, his speech patterns have begun. According to studies of the language ability of developing children the one word "sentence" of the child under two years of age increases to a length of about five words at six years of age, to twelve words by the time he is thirteen, and to about twenty words at the end of his adolescent period.[2]

Toward the end of his second year the average child usually has acquired a vocabulary of about twenty words whose meanings he understands. During the period from two to five years, the child gradually increases his vocabulary and improves his sentence structure to the extent that he can engage in simple conversation and give expression to his wants and developing ideas. Language habits then continue to progress toward adequacy of oral communication as a result of the number and kinds of experiences to which the young person is exposed, the kind of speech by which he is stimulated, and the efficacy of the

[2] M. E. Smith, *An Investigation of the Development of Sentence Structure and the Extent of Vocabulary in Young Children.* University of Iowa Studies in Child Welfare, Vol. III (1926), No. 5.

M. J. Stormzand and M. V. O'Shea, *How Much English Grammar?* Warwick and York, Inc., Baltimore, 1924. Also see W. C. Hoppes, "Consideration in the Development of Children's Language," *Elementary English Review*, XI (1934), and L. L. LaBrant, *A Study of Certain Language Developments in Children in Grades Four to Twelve Inclusive*, Genetic Psychology Monographs, Vol. XIV (1934), No. 5.

training which he receives in the various aspects of oral communication. Concerning this Witherington says:

> ... certain conditions must prevail if oral communication is to be effective. (1) There must be a common symbolism understood by both persons. (2) The producer must choose accurately the symbols used, because the consumer must depend upon them and not upon what was intended. (3) The consumer must have adequate apperceptive background to comprehend the matter symbolized. If any of these elements is lacking, the communication is disturbed.[8]

Speech difficulties. Much of what is known as "sloppy speech" — careless enunciation, inaccurate pronunciation, and ungrammatical sentence structure — is the result of inadequate training and can be corrected in the classroom by the application of remedial procedures. Serious speech difficulties, caused by factors such as deafness, defective speech organs, and aphasia, are pathological in nature and require the attention of an expert.

There is a close relationship between an individual's degree of mental acuity and the adequacy of his speech patterns. What he cannot understand he cannot express. Teachers on all levels are faced with the problem of the learner who is relatively inarticulate because of his slow mental reactions. For the mentally slow child, then, learning materials should consist of simple concepts, expressed in easily understood language, so that he may be able to recognize relationships between thought and expression. Thus he is enabled to develop a pattern of spoken language suited to his capacity to express.

The greatest incidence of speech defect, however, is of psychological origin. Fear of a situation (especially possible failure to achieve successfully in learning), emotional disturbance caused by maladjustment in the home or school, excessive timidity or shyness, or sudden shock may affect the speech patterns of an individual to the extent that he becomes inarticulate or develops a tendency to stammer or stutter. In cases such as these tensions must be released before the speech defect can be remedied. Patience and understanding on the part of parents and teachers are needed. If the condition is serious, the difficulty requires the attention of a psychiatrist.

[8] From H. C. Witherington, *Educational Psychology*, Revised Edition, p. 202. Copyright, 1952, by Ginn and Company.

DEVELOPING SKILL IN READING

The importance of reading. A group of college students were discussing the relative effect upon an individual of either blindness or deafness. Opinions differed as to which would be the greater handicap. Finally, one student made the following remark. "I would not want to be either deaf or blind, but if I had to have either defect I would prefer deafness. As long as I have my sight I am not cut off from the world of affairs. At least I can read!" This student's attitude is a generally accepted one. Most seeing adults would find it difficult to be denied the ability to read the daily newspaper, books, magazines, signs, or any other forms of written or printed material by which they are stimulated, as well as to see people and things about them.

Reading often is described as getting thought from the printed page. A better description of reading power might be that of putting thought into what is read — the symbols to which one responds visually.

A person may read for any one of many different reasons. He may read for the pleasure that he derives from a particular author's style or use of words. The reading may be done for the purpose of stimulating the imagination by way of fiction or poetry. The reader may want to gain information about people, things, or events. He may need to follow certain directions in order to carry on a project. He may want to share the experiences of his friends or associates, as these are presented to him in letter form. Regardless of the purpose of the reading, two factors are of prime importance: (1) mastery of the mechanics of reading, (2) development of the power to interpret correctly the ideas presented in written or printed form.

Reading is essential to learning. Hence reading cannot be considered an isolated subject of study. It is a tool of education that is utilized from the elementary grades through adulthood into old age, as the individual continues his formal or informal education.

Many adults do not appreciate the fact that their skill in reading has been acquired — that they were not born able to read and comprehend what they read. Yet there are good readers and poor readers. The development of reading competence should start early and continue through life. The form in which reading

material is presented, the learner's stage of readiness to interpret written symbols, his power to recognize combinations of words, phrases, and sentences, his ability to associate what he reads with his background of experience and the richness of that background, and the capacity to apply what he has read — all of these need to be considered if the individual is to acquire desirable skill in reading.

Because of the recognition of the significance of reading in the life of every individual, thousands of studies dealing with the various phases of reading skill have been published during the present century. In this brief consideration of the psychology of reading reference can be made to no more than a few of these studies. However, conclusions resulting from them will be incorporated in the discussion.

Psychological factors. The term *reading* includes *oral* as well as *silent* reading. Traditionally instruction in reading began with oral reading and proceeded from that to silent reading. Since oral reading combines reading for meaning with the factor of oral communication, beginning with an emphasis upon oral reading adds a learning difficulty that reduces reading rate by at least one-third. Hence most modern methods of teaching reading begin by emphasizing comprehension through silent reading. However, oral reading should not be neglected, especially during the early stages of training, since through it reading patterns can be fixed by utilization of visual, auditory, and kinesthetic or muscular sensations.

A child cannot be expected to make progress in learning to read until he has reached a state of readiness for instruction. Individual differences show themselves markedly in the degree of readiness of different children. Some children seem to "pick up" their early reading skills with a minimum of regular instruction; other youngsters are the despair of their teachers in the early grades. A child may seem to show little if any interest in or ability to read during the first year or so of his formal schooling and then suddenly start to read with apparent comprehension and interest. According to Harrison, the major factors of reading readiness include

(*a*) adequate mental age or maturity, (*b*) adequate visual powers and habits, (*c*) good hearing, (*d*) emotional adjustment, (*e*) adjustment to the school situation, (*f*) desire to read, and (*g*) specific skills in the reading

process, such as the possession of a range of concepts, ability to follow directions, visual discrimination, auditory discrimination and comprehension of a short, simple story.[4]

Other investigators include among the factors of readiness the effects of a child's experiential background as well as those factors resulting from the maturation process and the method of teaching that is employed.

The results of psychological studies also would seem to indicate that children can learn to read words as easily as they can learn to distinguish the letters of which the words are composed. In fact, a child may be able to pronounce a word and put meaning into it but be unable to spell it. In accordance with this psychological finding, modern methods of teaching reading emphasize meaningful units which may consist of short sentences, such as "My ball is blue," rather than what is referred to as the "alphabetical approach."

Eye movement in reading. Studies of eye movements in reading seem to give evidence that reading is a kind of visual exploration. The reader's eyes travel across the line on the page in jumps. It is during the pauses between the jumps that a word or a combination of words is recognized. By means of photographic recordings of the reading activity of an individual, it has been found that reading reactions include rate of recognition or duration of eye fixations, span of recognition or the number of words recognized in one attention span, rhythmical progress across the page or regression units per line, and — in oral reading — the eye-voice span by which is meant the number of letter spaces between the reading material upon which the reader's eyes are fixating and what is being vocalized by him.

According to Tinker [5] the amount of time devoted to eye movement averages from six to eight per cent of the reading time for most reading material. Results of studies in this field seem to indicate that the maximum time spent in eye movement is 10 per cent of the reading time, and that in difficult or involved

[4] Quoted from C. E. Skinner, editor, *Elementary Educational Psychology*, Second Edition, p. 378. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1950. See also L. Gray and D. Reese, *Teaching Children to Read*. The Ronald Press Company, New York, 1957.

[5] M. A. Tinker, "Time Relations for Eye-Movement Measures in Reading," *Journal of Educational Psychology*, 38:no. 1 : 1–10 (January, 1947).
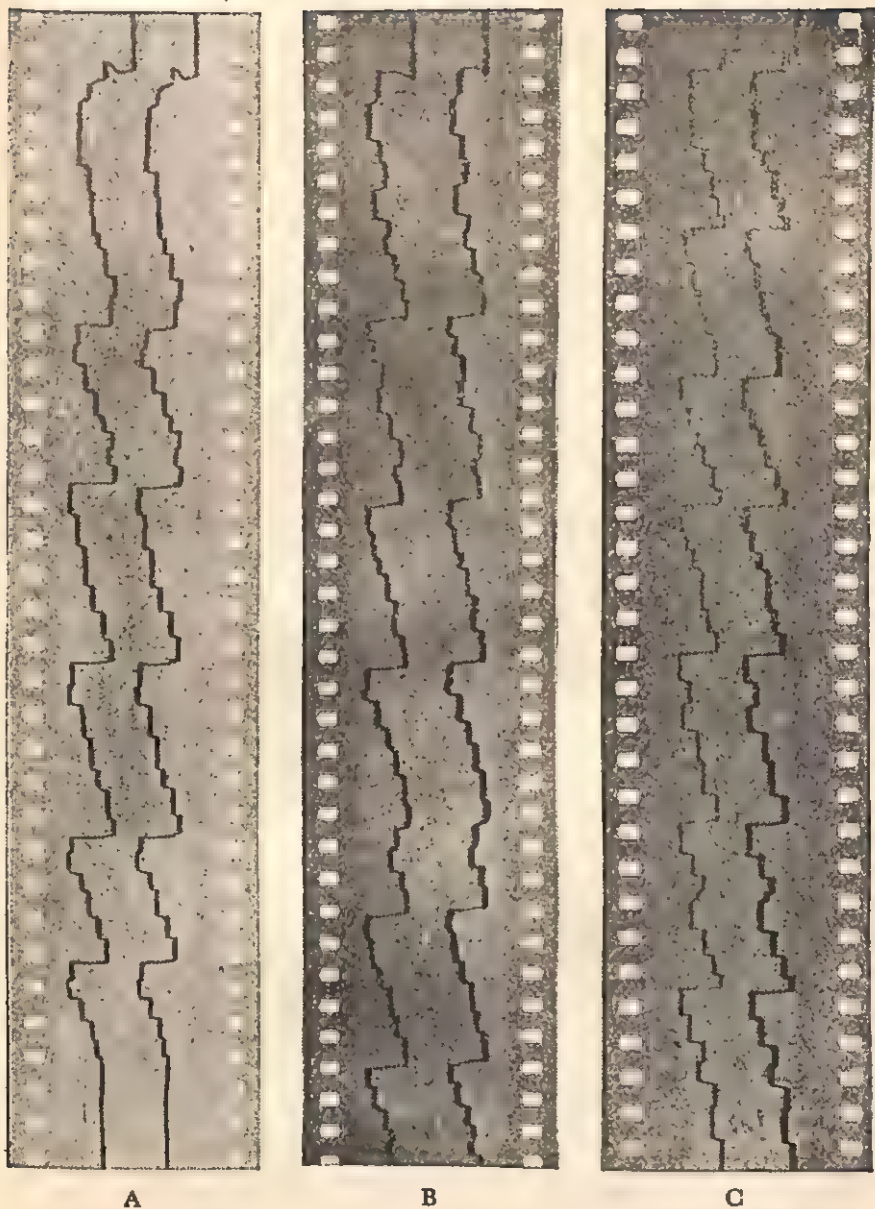
FIGURE 27. *Graphs of Reading Progress*

Reading graphs of a fourth-grade pupil (A), a high-school graduate (B), and a college junior (C). In each case the line graph for the right eye is on the right side of the filmstrip. The graphs for both eyes are similar if the eyes are coordinated. Vertical lines indicate fixations of the eyes, and the horizontal lines indicate movements between fixations. A long horizontal line moving backward indicates a swing from the end of one line to the beginning of the next.

See H. C. Witherington, *Educational Psychology*, p. 212. Copyright, 1946, by Ginn and Company. Courtesy of American Optical Company.

FIGURE 28. *Photographing the Eye Movements of a Grade Pupil with the Ophthalmograph*

Courtesy of American Optical Company.

reading, such as mathematical formulas, as little as 2.8 per cent of the reading time is used for eye movements.[6]

Eye movements should not be considered as ends in themselves in the teaching of reading. However, reading graphs that record photographed eye movements during reading help to reveal good and poor readers. The more skilled the reader, the fewer will be the fixations of the eyes, the shorter the duration of the fixations, and the greater the conformity to a definite reading rhythm. Figure 27 illustrates three grades of progress in reading skill, as shown in records of reading resulting from photographed eye movements. Figure 28 illustrates the photographing of eye movements of a grade pupil.

Other psychological factors. The development of skill in reading is dependent upon certain principles which include, among others, the following:

1. Reading ability increases with age and grade.

2. Other factors being equal, degree of intelligence determines the ease and correctness of reading comprehension.

3. Comprehension of reading material and rate of reading are closely associated.

4. Skill in reading is somewhat dependent upon the material selected for reading in so far as this is related to the learner's background vocabulary and his accustomed kind of reading.

In this connection, reference can be made to a study of the effect of language style on reading performance. As a result of the study it was found that "(1) vocabulary is not the only determinant of paragraph comprehension; language structure is important; (2) indications were found that both intelligence and training seemed to affect facility in reading a complex language style."[7]

In order to ensure improvement in reading skill, reading material should be graded to the maturity status and interests of the learner. Care should be exercised by teachers from the primary grades through the college level that the learner is skilled in the mechanics of reading, that he is sufficiently mature to understand the content of what he is reading, and that he can

[6] See also F. G. Ledbetter, "Reading Reactions for Varied Types of Subject Matter: An Analytical Study of the Eye Movements of Eleventh Grade Pupils," *Journal of Educational Research*, XLI: no. 2: 102–115 (October, 1947).

[7] F. P. Robinson, "Effect of Language Style on Reading Performance," *Journal of Educational Psychology*, 38: no. 3: 155–156 (March, 1947).

apply reading content to the operation of his own mental processes.

Too often, teachers, especially on the high school and college levels, assume a degree of reading comprehension on the part of a learner that does not exist.[8] Ideas presented in textbooks or supplementary reading matter become distorted in the thinking of the reader, and inadequate or inaccurate impressions result. One of the authors experienced a striking example of this lack of comprehension. In a college class consisting almost entirely of upper senior students there happened to be a young man of the lower junior class who, in so far as the class materials were concerned, was not yet mature enough or sufficiently well read to obtain from the reading assignments in the course the ideas that were basic to class discussions. Consequently, he persisted in presenting opinions that were irrelevant to the discussion and not based on fact. The impatience of his fellow students finally found expression in a remark made to him by one of the more able and better read students of the class, "You'd better keep still, little boy, until you are old enough to know what we are talking about." Instances of this kind are common on all school levels. The "poor" reader is at a decided disadvantage among his more skilled associates.

Remedial teaching. Skill in reading cannot be achieved through mass education. Individual differences must be discovered and remedial techniques applied when weaknesses of one kind or another show themselves. Through the administration and interpretation of tests of reading achievement, teachers can discover the reading status of individual pupils and apply remedial teaching when or where it is needed. Much more of this type of remedial work should be done on the elementary level than now appears to be the practice. It may be psychologically desirable to allow children to progress in school in terms of their chronological age and degree of physical and emotional maturity. However, unless a young person gains competence in the fundamental tools of learning, any further attempts at continuing his education are likely to cause failure for himself and distress to his teachers.

It is discouraging for a high school teacher to be faced with

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[8] See R. Strang, *et al.*, *Problems in the Improvement of Reading*, Second Edition. McGraw-Hill Book Company, Inc., 1955.

the problem of guiding the learning activity of pupils who enter high school with a reading grade that is normal for a fourth-grade elementary school pupil. In general, the textbooks that deal with subject matter on the high school level are intended to be read and studied by learners who have achieved a reading skill of at least eighth-grade level as measured by standardized achievement tests in reading. To expect a young person to achieve success in his learning experiences on the high school level if his reading status is far below that which is normal for his age and grade is asking almost the impossible.

Although a great deal has been done in the way of study and investigation aimed at the improvement of reading instruction, there still is much that needs to be known concerning the psychology of developing reading skill. Training in the mechanics of reading, developing power of comprehension, and encouraging attitudes or mind sets that will impel the individual, young or old, to increase his own skill in putting thought into the printed page are responsibilities of school people on all levels, if individual mastery of the tools of reading are to serve the best interests of the individual himself and of society.

DEVELOPING SKILL IN WRITTEN LANGUAGE

Purposes of written language. In a simple form of civilization it might be possible for a person to experience a relatively satisfactory pattern of life without the ability to express in written form his wants, thoughts, and interests. However, even the earliest peoples attempted to put their ideas into permanent form according to techniques evolved by them. "Picture" writing gave place to the development of hieroglyphics that consisted to a great extent of "action" symbols. It is in the relatively recent past that written expression has become conventionalized as symbols or letters that, combined, give words which can be arranged in such way as to express thought in more or less abstract terms in the form of sentences, paragraphs, and longer and more involved written "compositions."

In a complex civilization written language serves many purposes. Reed summarizes some of the aims of written English as

the ability to write a note, copy and formulate a message, write a courteous and formally correct letter, write a narration of a series of events observed, compose a summary of the main points in a story or

assigned reading, make an outline of the main points in a talk or lecture, and work out a readable and intelligent report of a first-hand investigation.[9]

The various purposes which are served by written composition, such as narration, description, letter writing, etc., do not follow one another in progressive order but represent aspects of written language that can be utilized by the child as well as by the adult. Hence learning in these areas should start in simple form as early as the child is able to recognize the value to himself of participating in the activity. As the learner's need of these tools of expression increases with the requirements of his broadening experiences, so should his facility in written expression take on more advanced and complex form.

Whether the form of written expression be simple or involved and whether the purpose of the writing be purely social or deal with abstractions, the writer must have something about which to write and possess skill in the writing. There may be differences of opinion among teachers concerning the relative importance of the ideas expressed as compared with their mode of expression. However, it cannot be disputed that a composition may be technically correct from the point of view of the mechanics of writing but contain nothing worth reading. Also, a piece of written work may contain many excellent ideas, but if these ideas are expressed inadequately or without concern for clarity of expression, the reader may lose whatever is of value in the thought content of the written material.

The chief purpose of written composition is to express clearly those ideas which have value to readers in one or another situation. Instruction in written composition, therefore, as in oral communication must include careful consideration both of the content of the composition and of the mechanics and style of writing.

Specific factors. Rare is the person who is able to achieve facility in written language without experiencing learning aimed at the development of this educational tool. Many factors may affect the degree of competence attained as a result of learning. The genius of a Shakespeare or a Milton may be lacking in all but a very few individuals. However, an ordinarily intelli-

[9] From H. B. Reed, *Psychology of Elementary School Subjects*, p. 130. Copyright, 1938, by Ginn and Company.

gent person who is motivated by his interest or need to express his thoughts in written form can be helped to gain an acceptable degree of efficiency.

Growth in power in written language increases with maturation and with participation in effective learning situations. Certain psychological principles that are fundamental in learning should be known and applied by teachers in their English instruction beyond the primary grades. As a result of his study of teaching practices in the field of English, Johnson has formulated the following five psychological assumptions upon which can be based effective educational procedures:

1. The imitative tendency, which is strong in the early years of child life, appears to weaken perceptibly during the period of middle grade instruction.

2. With increased socialization the child becomes more conscious of himself as an integral and performing member of a group to which he owes certain responsibilities and loyalties.

3. At approximate entrance to junior high school the process of "conscious learning" becomes more apparent and significant.

4. Psychological growth brings magnification of purpose as a directive influence in learning.

5. Expansion of experience, both direct and indirect, which accompanies the development of the junior high school pupil supplies the materials for more extended and versatile patterns of thinking.[10]

Acquiring skill in written language. Critical evaluation of the form and content of children's composition is a necessary part of English instruction. However, it is psychologically unsound for a teacher to place so much emphasis upon errors in spelling, punctuation, and sentence structure that an evaluation of the content of the composition is neglected. It is discouraging for a pupil to have his teacher return his composition liberally sprinkled with red pencil marks. Too often the child is unable to interpret the meaning of these marks and little is done by him or the teacher in the way of making adequate changes.

It is possible for a teacher technician to help his pupils to develop skill in the mechanics of writing. However, if the teacher himself lacks vision and creative power, the compositions written

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[10] From R. I. Johnson, "Psychological Implications for the English Curriculum," in *Growth and Development*, pp. 199–204. Copyright, 1936, by Progressive Education Association (now American Education Fellowship).

by his pupils may be mechanically correct but stilted and artificial. The learner needs to be motivated toward expressing in written form those ideas and experiences that are interesting to him and that are suited to his age, school grade, and mental ability. There are teachers who seem to be able to encourage in their pupils the desire to engage in worth-while creative writing. But the writer needs also to be guided toward an appreciation of acceptable writing style and precision of vocabulary.

If the teaching-learning process in the vernacular on any school level is to result in the production of skill in written language, the individual must develop the habit of self-criticism. Before he writes he must have prepared mentally or on paper a well-organized outline of what he wants to say. Then he consciously should attempt to choose the form of expression that will make his meaning clear to the reader, and at the same time try to stimulate interest through the smoothness of the writing.

Individual differences. Individuals differ in their ability to express themselves satisfactorily in written form. Most children improve in their written work as they increase in age and maturity. Techniques of instruction also constitute a factor of difference. However, pupils of the same age and grade and taught by the same teacher often give evidence of wide differences in performance.[11] Sex differences show themselves on all levels. Girls usually are able to express themselves somewhat more fluently, and possess a larger vocabulary, than boys of the same age and on the same school level. These sex differences may result from the fact that girls tend to give greater attention to details and to devote more time to reading than is characteristic of active, ball-playing boys.

Effect of the study of grammar. Opinions differ concerning the effect upon language ability of a detailed study of grammatical construction. Traditional emphasis upon the mastery of the rules of syntax, the analysis of long and involved sentences, and the parsing of all the words in a long and involved sentence has given way to almost incidental teaching of grammar on the elementary school level, with little or no time given to it on the secondary school level. The results of many studies in this area

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[11] See J. A. Van Bruggen, "Factors Affecting Regularity of the Flow of Words During Written Composition," *Journal of Experimental Education,* XV: no. 2: 133–155 (December, 1946).

would seem to indicate that there is only slight relationship between a pupil's mastery of grammar as such and his facility in oral or written language.

Interestingly enough, however, teachers of English in high schools are beginning to appreciate the fact that some acquaintance with the principles of grammatical construction is valuable in helping a learner to improve his use of English. One school system that had thrown grammar almost completely overboard as a specific field of study is beginning again to give some attention to it. In some of the high schools of this particular community the first five or ten minutes of the daily English period are devoted to a consideration of grammatical principles and their practical applications.

A return to the old days of formal study and memorization of grammatical rules is not advocated by the authors, but their experiences in teaching on lower school as well as college level cause them to believe that correction of errors in usage is made more meaningful if the pupil understands the reason for his error. Hence some study of grammar seems to be a necessary part of instruction in language. Just how much and what should be included needs further study.

DEVELOPING SKILL IN SPELLING

Importance of correct spelling. At the two ends of an educational pole respectively are (1) the otherwise intelligent and well-educated person who prides himself on his poor spelling and is prone to remark that a genius never could spell, and (2) the traditional schoolmaster who seems to make a fetish of "spelling bees" in which children are expected to spell correctly words that are long or tricky, and the meanings of which often are not known even to the "star" speller. A desirable attitude toward spelling probably lies between these two extremes. The brilliant scholar who is a poor speller indicates thereby his lack of concern with the practical details of language. He is unable or unwilling to master them, apparently expecting his associates to excuse his poor spelling because of his other accomplishments which to him possess greater value. The schoolmaster gives evidence of the fact that in his thinking spelling should be taught for its disciplinary value rather than for its practical use in writing.

The teaching of spelling should be aimed at the pupil's mastery of those words that he will need in daily life. A person's spelling or, more correctly, writing vocabulary should include all the words that he will need as he attempts to engage in this or that form of written expression of his ideas. Some teachers, as they warn their pupils to be sure that every word in an assigned composition is spelled correctly, have been known to advise the learners that if they do not know how to spell the word they wish to use they should substitute for it a word they can spell. This is poor advice if preciseness of meaning is to be characteristic of written language. Although the present trend in writing is toward simplicity of vocabulary, the learner should be motivated toward using the word which best fits the meaning that he wishes to convey and to learn to spell the word correctly.

There are certain basic words, many of them consisting of not more than two syllables, that are misspelled frequently by adults as well as by elementary school children. The correct spelling of words such as those represented in Jones's list of "The One Hundred Spelling Demons" should become *fixed* as early as possible so that concern with their spelling does not interfere with flow of ideas as a person of any age engages in written language. Studies in spelling would seem to indicate that all other words are mastered best when they are learned in context rather than as isolated words in list form.

The achievement of a writing vocabulary. If spelling is to function as an aid to careful writing, a learner's writing vocabulary should be adjusted to his developing writing needs. Buckingham and Dolch [12] have arranged word lists of 19,000 words according to frequency of use, 10,000 of which are graded in terms of their expected use by pupils in successive grades of the elementary school. These lists, however, do not include specific terms that may appear incidentally as a part of a particular field of learning and that should be mastered for immediate as well as future use.

Learning to spell is an individual matter. Included in the process are the perception of the word and the interassociation of its parts. Since many words in the English language are not pronounced as they are spelled, visual imagery rather than

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[12] B. R. Buckingham and E. W. Dolch, *A Combined Word List.* Ginn and Company, Boston, 1936.

auditory imagery is preferable, although the latter has value in fixing the spelling of the word. Also, as the learner spells a word aloud his learning is helped by the vocal experience, and as he writes it, by the kinesthetic experience.

Many studies have been conducted concerning the psychological factors involved in learning to spell. Complete agreement has not yet been reached as to the validity of some of the conclusions resulting from these studies. Some investigators favor the method of generalization, in which words are grouped according to a common element and rules of spelling are used indirectly rather than as a starting point for the teaching of spelling. Others believe that equally successful results can be achieved by specific teaching of individual words and application of the rules of spelling. It is rather generally conceded, however, that further investigation is needed.

Questions have been raised concerning the use of rules in spelling, the defining of words as the spelling of them is taught, the length and number of practice periods, and the effect of one or another mode of presentation upon the growth of spelling skill. Spelling always has had and should have an important place in the school curriculum. There are said to be "naturally good" spellers and "naturally poor" spellers. This is an erroneous use of the word *natural*, since correct spelling is an acquired skill. There are certain errors of spelling that are so common that teachers can prevent their occurrence through the utilization of proper teaching techniques and adequate drill. Other errors are peculiar to one individual rather than to another and require special attention.

The more intelligent an individual, the more likely he is to become a good speller if he devotes enough attention to mastery of this skill, although slow learners have been known to exhibit considerable ability to learn to spell correctly through the application of rote memory. Spelling rules have value if they are applied as needed, and not as a teaching end. Transfer of learning appears to function in graphic forms of words rather than in word meaning. For example, in the lower grades much stress is laid upon word "families" in the development of which a simple syllable, such as *ing*, is used as a base for the building of words — sing, bring, ring, thing, fling, wing, king, etc.

Finally, before a spelling lesson is started, those pupils who

already know how to spell some of the words to be "taught" should be saved the boredom of participation in relearning material already mastered. This can be done by beginning the spelling lesson with a pretest aimed at discovering which words can be spelled correctly by which pupils. Class practice then is limited to the words misspelled by all or most of the group. Another helpful device is to have pupils keep individual word books in which are listed those words, spelled correctly, which cause them difficulty.

DEVELOPING SKILL IN HANDWRITING

Writing readiness. A child has reached a stage of readiness for instruction in penmanship when he has gained sufficient control of his muscles so that he can manipulate chalk, a crayon, or a pencil and when he is motivated by interest or need to express his thoughts in written form. The average child is not ready to adapt his developing muscular control to skill training until he is about five years old. Hence, although in the nursery school the child is given an opportunity to express his ideas in the form of drawing or scribbling on large sheets of paper, he is not ready to engage in the coordinated muscular movements that are needed for writing. By the time he is five he has gained such control and also can associate visual and kinesthetic sensations. He must see what he should copy, he must get the feel of the muscular activity needed, and he then must compare his efforts with a model. At first his handwriting should be large and free. Later he should be able to acquire smaller and more refined movements. Penmanship is a complex sensori-motor skill that is developed slowly as the child acquires (1) improved perception; (2) dexterity in hand, wrist, finger, and arm movement; and (3) memory for details.

Development of skill in handwriting. For handwriting to be legible the letters should be well formed, the spacing between letters adequate, and the slant regular. Hence, acquiring handwriting skill not merely is a matter of perfection of form of a single symbol or letter but constitutes the putting together of these letters into a uniform pattern of words, phrases, or sentences. The diffusion that is characteristic of a young child's early movements becomes refined as a result of his conscious attention to writing. Judd explains this process in the following way.

Let the letters *a*, *b*, *c*, *d*, *e*, and *f* symbolize the muscles of the trunk, face, head, legs, arm, and various parts of the hand which are active in the early stages of diffusion in a pupil's efforts to write. If *e* and *f* represent the muscles of the arm and hand which must act in producing written letters, it is evident that *e* and *f* must ultimately be employed in every successful performance of the learner. It is also evident that, if the learner is to master the art, he must continue his efforts until *e* and *f* achieve the ends at which he is aiming, namely, imitation of the model. The learner sees his pencil and the effect which it produces. He sees the copy which he is trying to reproduce. He keeps trying to imitate the model until there is some agreement between the model and what he produces.[13]

This process is referred to as a "process of selection through comparison" that finally becomes so automatic that the trained penman does not need to give conscious attention to each movement that is performed in writing. He has achieved muscular coordination, accompanied by an awareness of success.

The development of legible handwriting includes training in the position of the hand, movement, and rhythm. Many investigations have been conducted to ascertain the psychological factors that differentiate good writers from poor. One of the earliest of such investigations was made by Freeman. As a result of his study of the position of the hand, the type of movement used, the rhythm of writing or the relation between units of movement and units of time, he concluded that the proper habituation of position, desirable movement, and rhythm are fundamental to legible handwriting.[14]

Teaching techniques. Methods of teaching penmanship have varied from almost complete emphasis upon finger movement to a similar emphasis upon arm movement. At present there seems to be favored a combination of both arm and finger movement. There is a growing trend toward limiting writing in the lower grades of the elementary school to manuscript form. The change to cursive writing is made by the learner when he reaches the fourth grade. It is claimed that the similarity of manuscript writing to ordinary print eliminates the necessity of the child's learning two forms of letters. Also, as each letter stands alone in

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[13] From C. H. Judd, *Educational Psychology*, pp. 68–69. Copyright, 1939, by Houghton Mifflin Company.

[14] See F. N. Freeman *et al.*, *The Handwriting Movement*. The University of Chicago Press, 1918.

manuscript writing greater attention can be given to precise letter formation. As a child becomes more mature and gains greater facility in adjustment, he then is able to develop skill in cursive writing. However, more experimentation is needed before a final conclusion can be made concerning the value of beginning with one form of writing and then changing to the form which eventually is expected to be used.

Value of legible handwriting. Any high school or college instructor will tend to agree with the authors that, by and large, the young people of America are notoriously poor penmen. Some instructors will not accept themes unless they are type-written, because of the difficulty of wading through pages of almost illegible writing. Too often it is almost impossible to decipher a person's signature. On most formal documents, names are expected to be typed so that they can be read.

Insufficiently fixed habits formed during the elementary school years and an excess of note-taking during the high school and college years are causes of penmanship that is little more than an illegible scrawl.[16] It has been suggested by business and professional people that practice in handwriting should be continued on the upper levels of schooling or that all written communication should be presented in typewritten form.

Individual errors in penmanship should be discovered early, and drill administered. Because of the complexity of the writing process, including both muscular control and mental activity, it is to be expected that each person will develop his own particular style of handwriting. However, whatever style one adopts as that peculiar to himself, education has failed if the products of our school systems do not achieve a legible and attractive style of handwriting.

DEVELOPING SKILL IN FOREIGN LANGUAGES

Purpose. The study of foreign languages in American schools, especially on the secondary and college levels, has had a long and devious history since the vernacular supplanted Latin as the language of study in the American academies. Since the 1750's Latin has been kept in the curriculum for election by those who are classically minded, who feel that the study of Latin is a mark

[16] See L. Quant, "Factors Affecting the Legibility of Handwriting," *Journal of Experimental Education*, XIV: no. 4: 297–316 (June, 1946).

of culture, or who are preparing for entrance into colleges which demand Latin as a prerequisite for entrance.

Modern foreign languages have been included in the curriculum for various reasons. The close relationship that existed between France and nineteenth-century America was one of the reasons for the popularity of French. German was the language of science, and Spanish was introduced into the schools because of possible business relations between the United States and its Latin American neighbors.

Reasons other than these have been offered from time to time for the inclusion in the school curriculum of the classical or "dead" languages (Latin and Greek) and the modern languages (French, Spanish, German, Italian, or Hebrew, and more recently Russian and Chinese on the college level). It has been claimed that, apart from cultural or practical values inherent in the mastery of any one or more of the foreign languages, such study has great carry-over value for the vernacular, thereby improving a person's command of his own language.

There is wide difference of opinion concerning the value to a student of taking a two- or three-year course in a foreign language. At one extreme are those who advocate not only the continuance of whatever now is being done in the field but even an extension of foreign language study. At the other extreme are educators and students who would drop all study of foreign languages from the curriculum of secondary schools and who would include foreign language study in college only for those students who have a practical reason for wanting to master these languages — not as a requirement for all students.

Difficulties encountered. If a language is to be effective as a tool subject, the learner must be able *to think* in the language in which he expresses himself. If an individual begins his study of a foreign language after he has developed fixed habits of thought in the vernacular, it often is difficult for him to think in a foreign language, especially if he spends no more than two years in its study.

The learner is confronted with the foreign words: he must learn their English equivalents. Then he is expected to use the foreign words in meaningful form. The mental processes usually engaged in by the learner consist in first organizing his thoughts in the vernacular, and then trying to find the correct words and

16. Discuss the different methods of approach to a foreign language that have been presented in this chapter. Justify psychologically the one that you prefer.

17. Discuss transfer of training as it operates either in the vernacular or in a foreign language field.

18. To what extent are you in agreement with the point of view that some learning should be engaged in for no other reason than the enjoyment that can be derived from the study?

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22

ACQUIRING MATHEMATICAL CONCEPTS

M ODERN theory in the area of mathematical teaching and learning emphasizes the functional value of mathematics in the life of the learner from his early years throughout his training period. It claims that the language of mathematics — numbers and symbols — should be associated with the practical experiences of an individual to as great extent as possible. Learners are confronted in their daily life with many practical problems dealing with number, hence teaching should be based on problems that will afford concrete experience.

Children need to learn early to evaluate life's experiences quantitatively. They gain thereby some degree of mastery over the environmental situations that confront them. With increased maturation and expanding interest, young people come to develop a more intense desire to meet the new requirements of their changing experiences. Fortunately, there has been a tendency on the part of school people to organize study in mathematics in such a way as to cope with levels of maturation and expansion of interests. Mathematical "brain teasers" having little value are being eliminated from regular textbooks.

PSYCHOLOGY OF ARITHMETIC

Acquiring number concepts. Just as early man began his mastery of mathematical concepts with an understanding of "muchness," or "moreness," so does the very young child, for example, desire "moreness" of candy. Gradually this general concept gives way to the recognition of *two* pieces of candy as

more desirable than *one* piece. It is observed that the child's concept of number at first is related to concrete objects. Later he develops an understanding of the meaning of the abstract terms used by him and others.

Children hear others count and use numbers long before they know what the numbers mean. However, they do learn, for instance, that there is *one* person present, that houses have numbers, and that the days of the month follow one another in number sequence. Even though children see and recognize these numbers before they can count, they are helped thereby to understand the fact that numbers aid in identifying objects. They know that a man is identified by his name but a house by a number.

Sometimes a child learns to count by repeating numbers from one to ten or further, without really grasping the idea of what each number means. It is true that he may count his fingers but that does not mean necessarily that when he says "seven" he has any clear understanding of what is meant by seven objects. Unless meaning is built into the abstract term, it remains simply a word or a symbol. Learning to count is a mental function that develops gradually and, like the ability to read, shows progressive improvement with increased learner experience. Children need help in attaching proper associations to particular numbers so that the latter can be arranged in correct relationships. Although many individuals cannot comprehend the significance of 1,000,000, every child should develop the ability to attach meaning to numbers of increasing size as he matures and progresses through the school, grade by grade.

According to Brownell, as a child develops concepts of number and ways of dealing with concrete numbers, he goes through a continuous process as he progresses from simple primary concepts to more mature stages of mathematical understanding. He learns to count, to recognize, and to apprehend certain combinations and arrangements of objects. For example, if a child wishes to apprehend a number of line marks such as these: | | | | | | | | | | | | | |, he is likely at first to count them one at a time; later he may count them by two's, then by three's, and perhaps he later may be able to apprehend them in groups of four. However, if the problem is to apprehend a different kind of number picture, such as : : : :, the child may count these

one by one, he may recognize a relationship of groups of two, he may finally apprehend them as two groups of 4's. It is Brownell's belief that a pupil "who counts in order to apprehend : : : : has made little advance toward abstract number. For him number consists in a succession or an aggregate of sensory objects or events." However, a pupil "who, in apprehending : : : :, habitually disregards the separate individual items in the objective representation and substitutes some such process as 4 + 4 is well on the way to abstraction." [1]

Along with the meaning that is associated with numbers goes an attitude toward them that has grown out of experience with them. It is interesting that, upon introspection, we usually find an attitude of one kind associated with 100 and another attitude associated with 98. Especially is this true if we are considering the cost of an article. Storekeepers recognize this fact, as evidenced by their pricing articles at 98 cents or $1.98 rather than at one dollar or two dollars. Specific attitudes may become attached to numbers such as 3 or 13, 7 or 11, 16 or 21, 45 or 70. Judd says, "Whatever the source of the attitudes attaching to numbers, one fact is clear: each number ultimately has a unique character." [2]

Objectives in arithmetic. The primary aims in the teaching of arithmetic are (1) to acquaint the child with quantitative relationships as an aid to his daily application of them, and (2) to develop his ability to understand problems of present-day living that deal with number and quantity relationships. The number concepts arise out of perceptual experiences, and the concrete material utilized serves as a stimulus for the organization of appropriate ideas.

According to Wrightstone, arithmetic has the following functions:

. . . (a) the computational function, where the emphasis is placed upon the development of essential computational skill; (b) the informational function, which emphasizes the understanding of such institutions as banks, insurance, and taxation, where the social uses of number are extensive; (c) the sociological function, which emphasizes an under-

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[1] W. A. Brownell, *Development of Children's Number Ideas in the Primary Grades*, p. 221. Supplementary Monographs, No. 35. Copyright, 1928, by University of Chicago Press.

[2] From C. H. Judd, *Educational Psychology*, p. 294. Copyright, 1939, by Houghton Mifflin Company.

standing of the problems faced by institutions that use numbers extensively; and (*d*) the psychological function, which emphasizes quantitative thinking and relationships or methods in dealing with situations involving number experiences.[3]

Psychological factors. The learner needs to understand and master the relationships that exist among numbers since numbers constitute a system that is an inheritance of our race. While drill is essential, arithmetic is not essentially a drill subject. Thinking is required of the learner in arithmetic, as in all subjects; the teacher, however, must avoid doing the thinking for the learner. When the need arises, the child learns to use numbers in his own problems on the playground or in the home. Woody reports in his study of the arithmetical backgrounds of young children that many of them attain considerable ability in dealing with simple numbers in counting or in telling time before they begin their school life.[4] In the school as in the home or on the playground the child should be given an opportunity to make practical application of the number system as he learns it.

Number combinations used in addition, subtraction, multiplication, and division are presented to the learners in the school. As meaning is attached to these combinations their nature is better understood, and the learner is benefited to the extent that he uses them correctly. However, each time a learner makes a mistake in his application of number combinations, he confuses to that extent his experience with those combinations.

Failure in mathematical computation often is caused by lack of mastery of number concepts and the proper use of them. The result is an accumulation of failure in mathematical comprehension as a child progresses from grade to grade. An understanding of principles rather than memorization of rules should be the goal. However, there are principles that, regardless of the child's understanding of them, should be applied, and drill should be administered until the applications become established habits. The rule used in the division of fractions — invert the divisor and multiply — may be cited as an example of a princi-

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[3] From J. W. Wrightstone, "Psychology of the School Subjects," in *Elementary Educational Psychology*, Second Edition, edited by C. E. Skinner, p. 371. Copyright, 1950, by Prentice-Hall, Inc.

[4] See C. Woody, "The Arithmetical Backgrounds of Young Children," *Journal of Educational Research*, 30:188–201 (1937).

ple that on the elementary school level at least can be applied without explaining its underlying meaning.

Investigations show that children's mastery of number combinations follows a psychological rather than a logical sequence. Hence the traditional method of presenting the multiplication table beginning with the 1 ×'s table and proceeding in logical order through the 12 ×'s table is giving place to the breaking up of these tables in terms of the ease or difficulty of individual combinations. It has been found, for example, that 9 × 5 is relatively easy but that 7 × 9 is more difficult. Also, the fact that a child has mastered the combination 4 × 8 does not necessarily mean that he also knows the combination 8 × 4. The combination 4 × 8 is for the child psychologically a different combination from the combination 8 × 4. Hence each must be mastered.

A valuable study in the learning of third grade arithmetic was made by Brownell [5] with the assistance of Kuehner and Rein. In this study emphasis was placed upon the concept of learning as reorganization of experience. It was demonstrated that desirable learning outcomes can be achieved if the learner is permitted to make use of certain crutches in the early stages of his learning.

For example, the investigators undertook to discover whether the teaching of borrowing in subtraction should begin with the use of a crutch. They raised the question of the desirability of training a child from the beginning to perform mentally the processes involved in an example similar to the following: $\frac{75 \quad -28}{47}$ as compared with permitting him at first to use an aid or crutch in the form of paper-and-pencil notations such as: $\frac{6 \atop \cancel{7}{}^1 5 \quad -2\,8}{4\,7}$. Later, the learner is expected to dispense with the crutch and perform the borrowing operations mentally. They found that:

1. With regard to accuracy, the crutch has been shown to have made important contributions in the early stages of learning to borrow. . . .

[5] See W. A. Brownell, K. G. Kuehner, and W. C. Rein, *Learning as Reorganization* (*An Experimental Study in Third-Grade Arithmetic*). Copyright, 1939, by Duke University Press.

2. With regard to rate of work, the evidence is that at first the crutch imposes no handicap. . . .

3. . . . the children who used the device not only were able to make higher scores on borrowing examples, but they were protected from loss of efficiency with familiar non-borrowing examples.[6]

Other conclusions arrived at by these investigators are:

1. To the general question, Were children who learned the crutch incapable of getting rid of it? the answer is a categorical No. It is safe to say, then, that to teach the crutch is not, as has been frequently asserted, to condemn children forever and inevitably to reliance upon it. . . .

2. The tendency to retain the crutch needlessly and the opposite tendency, to drop it even too soon, seem to be in no way related to such factors as CA, MA, IQ, or a given level of rate and accuracy of computation. . . .

3. Not all children were able to pass immediately and directly from reliance upon the crutch to its omission. . . .

4. The crutch does not entirely disappear even in the case of children who seem to have dropped it completely.[7]

It is important that number combinations be *overlearned.* Standardized drill cards, such as those devised by Courtis, Studebaker, and others, usually are more effective than haphazard informal drills. Drill should be spaced according to the age and grade of the learner. Concentrated, continuous drill is less economical than drill that is properly distributed. A short daily practice period yields effective results in the fixing of number combinations so that they become usable. To discover individual errors use should be made of diagnostic tests in the fundamentals in arithmetic. Remedial instruction should be based upon the results of these tests.

The teacher's attitude toward the teaching of arithmetic also has a profound effect upon the interest and achievement of the learners. Appropriate problems taken from life situations should be utilized for drill so that the learner may be motivated toward the mastery of the fundamental processes. The student in educational psychology should know that the processes involved in the solution of mathematical problems are developed gradually and

[6] From Brownell, Kuehner, and Rein, *op. cit.,* p. 47.
[7] *Ibid.,* pp. 67–68.

result from the organization of experience. The expenditure of time and well-planned effort is required in the gradual fitting together of many elements before mathematical abstractions can be mastered.

Problem solving. Ability to solve problems improves with growth in ability to read. Since an understanding of a problem is essential to its solution, the use of familiar terms in stating the problem simplifies its language and allows for ease of understanding. Keeping the problem on the level of the child's daily experiences aids in his understanding of the language of the problem and in his ultimate comprehension of its meaning.

Training given in the classroom in problem analysis increases the learner's ability to solve problems on his own. Also, systematic practice in the solution of many similar problems acts as an aid in the development of problem-solving ability. Correct techniques should be used so that errors may be avoided; but when errors are made, systematic practice of the correct procedure in the solution of problems involving reasoning will improve the learner's ability to solve such problems.

Stages of growth. In discussing the developmental levels in arithmetic, Brueckner lists five stages of growth and explains them as follows:

Stage 1

The stage at which readiness for formal number work is attained. During this period the child acquires a considerable variety of simple quantitative concepts and a small quantitative vocabulary through incidental contact with number in his daily informal experiences, and through guided experiences and training in school that promote number readiness. This level comprises the preschool years, the kindergarten, and usually at least part of Grade I.

Stage 2

The initial stage in learning arithmetic. This usually comprises Grades I and II, during which the child acquires the ability to read numbers, to count systematically, and to group and compare objects. He also learns easily the basic number facts of addition and subtraction, either through organized teaching or through informal procedures. Through well-chosen social activities involving simple applications of number in measurements and social practices, the pupil can readily be led to acquire a rich background of meaning, which will facilitate more formal learning at the next stage. There is a rapid increase in his

arithmetical vocabulary. Usually there is considerable interest in number work.

Stage 3

The stage of rapid progress in fundamental arithmetic habits and attitudes. This stage includes in general Grades III and IV, during which the pupil masters the simpler processes with whole numbers readily, his knowledge and understanding of social arithmetic is expanded, and he develops the ability to apply simple quantitative methods in his affairs. At the end of this stage the pupil should have mastered the addition and subtraction facts, the easier multiplication and division facts, and the simpler computational processes involving whole numbers. He should also have an understanding of the meaning and uses of the more common fractions.

Stage 4

The stage during which social experience extends rapidly and increased power, efficiency, and skill in arithmetic computation are developed. This stage includes Grades V to VIII, during which occurs the learning of generalized number concepts, more difficult processes in fractions of various kinds, long division, and more difficult social applications of number, and during which there is rapid growth in power to think quantitatively.

Stage 5

The stage at which special aptitudes appear and broader interests are developed. This stage is at the high school and college level, at which point special aptitudes are recognized, interests are developed and broadened, and a high level of efficiency in the uses of number is secured.[8]

Brueckner points out that these stages of development should be used only as guides. The stages are not sharply differentiated but merge gradually as parts of a continuous process of growth.

The results of a study by Washburne concerning minimum and maximum mental levels for various topics in arithmetic are enlightening. Attention should be given to these facts in the teaching of arithmetic so that individual differences and levels of maturity may be considered in relation to each learner. In Table XII are presented the data that resulted from Washburne's study.

[8] From L. J. Brueckner, "The Development of Ability in Arithmetic," in *Thirty-Eighth Yearbook of the National Society for the Study of Education*. Part I, pp. 280–281. Copyright, 1939, by Public School Publishing Company.

TABLE XII.   *Minimum and Maximum Mental Levels for Various Topics in Arithmetic*

TOPIC	MINIMUM MENTAL AGE	OPTIMUM MENTAL AGE
Addition facts: sums of 10 and under	6 yr. 5 mo.	7 yr. 4 mo.
Subtraction facts: easier 50 and 100 addition facts	6 yr. 7 mo.	8 yr. 3 mo.
Addition facts: sums over 10	7 yr. 4 mo.	7 yr. 11 mo.
Subtraction facts: harder 50	7 yr. 8 mo.	8 yr. 11 mo.
Subtraction process: 100 addition facts, 100 subtraction facts	8 yr. 9 mo.	8 yr. 9 mo.
Meaning of fractions	9 yr. 0 mo.	10 yr. 9 mo.
Addition and subtraction of like fractions and of mixed numbers with like fractions (No borrowing)		
Addition facts		
Subtraction facts	9 yr. 10 mo.	11 yr. 1 mo.
Meaning of fractions		
Multiplication facts		
Addition facts	10 yr. 2 mo.	10 yr. 2 mo.
Compound multiplication		
Column addition		
Multiplication facts	10 yr. 4 mo.	11 yr.
Simple multiplication		
Graphs (simple bar)	10 yr. 5 mo.*	
Decimals: addition and subtraction		
Column addition		
Subtraction	10 yr. 11 mo.	12 yr. 6 mo.
Meaning of decimals		
Short division		
Subtraction facts	11 yr. 4 mo.	11 yr. 4 mo.
Division		
Meaning of fractions		
Grouping	11 yr. 7 mo.	13 yr. 4 mo.
Multiplication of decimals	12 yr. 4 mo.	13 yr. 11 mo.
Long division		
Subtraction		
Simple multiplication		
Short division	12 yr. 7 mo.	12 yr. 7 mo.

From C. W. Washburne, "Mental Age and the Arithmetic Curriculum," *Journal of Educational Research*, XXIII:210–231 (1931).   *C.A.

PSYCHOLOGY OF ALGEBRA AND GEOMETRY

Algebra. Algebra represents an extension of the numbers and symbols used in arithmetic as well as of the kind of reasoning with which the learner became acquainted in his study of arith-

metic. There is one fundamental difference, however, that should be made clear to all learners, namely, that arithmetic deals with numbers and combinations having specific values and that algebra is concerned with the general laws of mathematical processes apart from the quantitative value of each symbol used. Further, in algebra attention is given to signs representing positive and negative values. Thus the learner is introduced to a new language as well as to an extension of that already learned in arithmetic.

Through the use of formulas, letters, numbers, and signs algebra short-cuts many arithmetical processes. Since actual numbers are not used in the formulas, the laws of mathematical operation can be taught without the use of quantities whose value or magnitude is known. Abstractions in algebra are considerably more complex than those learned in arithmetic. The number symbols to which the learner already has been introduced are more or less associated with concrete objects. Hence the learner may become confused by the new number language with which he is confronted. His bewilderment may increase as he attempts to apply to the new form of learning material the thinking processes that he already has mastered. He now must learn to deal with mathematical combinations including symbols of indefinite value, rather than with definite numbers.

To succeed in algebra a pupil should be competent in arithmetic. The study of algebra is concerned with thinking processes which are so definitely abstract that the subject should be studied only by those young people who are able to master this kind of abstraction. It is difficult for the mentally less able learner to deal with indefinite and abstract quantities. Hence there is a high correlation between demonstrated ability in algebra and degree of intelligence. Exceptionally intelligent students who enjoy working with figures and abstractions take to algebra as a "duck takes to water." They often experience a feeling of boredom if they are required to follow the pace that is set in classroom work by less able learners. They may have mastered an algebraic concept and completed correctly assigned exercises almost before the majority of the members of the class have started to think about what is to be done. The results of a study concerning the reactions of bright students in algebra classes led the investigators to formulate the following conclusion:

Class time of superior students in regular Algebra classes can be reduced at least fifteen per cent without injury to learning included in the basic course of study, and with a significant increase in knowledge of the enrichment material.[9]

Studies also have shown that, on the average, boys are slightly superior to girls in their successful achievement in algebra. The difference is very little, however, and the reason for it is not fully known. Slow learners — either boys or girls — should be given a modified form of mathematics suited to their ability and experience levels. They are entitled to be given thinking experiences in these areas commensurate with their capacity for comprehension.

The thinking processes in algebra are illustrated in the following analysis by Breslich of eight equations involving the use of positive and negative signs.[10]

1. $-15 + 8 =$ 5. $(-4a^2)(+5a^4) =$
2. $-3 + (-6) =$ 6. $(-3a^3)(+7b^4) =$
3. $-25 - (-7) =$ 7. $-300 \div -3 =$
4. $(+6)(-4) =$ 8. $-25xy \div +5x =$

The analysis of the mental processes of the pupils, as made by Breslich, together with some of his observations, follows:

The following steps must always be taken in some order by the pupil if he is to arrive at correct answers.

1. The fundamental operation demanded must be recognized and the appropriate procedure followed.
2. The rule determining the sign of the result must be recalled and applied.
3. The proper combination of numerical factors must be made; that is, a purely arithmetical combination must be made.
4. The proper combination of literal factors must be made.

Each of these steps is itself a complex process. Thus, when a pupil decides by inspection of an exercise that it calls for multiplication rather than subtraction, he is guided in carrying on the process of multiplication by a whole series of experiences acquired while learning how to

multiply. Similarly, the application of the rule with regard to signs in the case of any one of the fundamental operations involves recognition of the signs of the two factors and selection of that part or phase of the rule which is appropriate. If the signs are alike, one procedure will have to be followed; if they are unlike, another procedure is demanded. Not only so, but the application of the rule governing signs differs according as the process is that of addition, subtraction, multiplication, or division. . . .

Observation of the pupils at work led to the opinion that the mental process actually used by a pupil in determining the sign in Exercise 8 consists of two parts: (1) The pupil recognizes that the exercise involves division. (2) He writes the sign automatically while he is concentrating on the remainder of the exercise. When he is asked to explain his method, he tries to recall the rule and usually states it in abbreviated form. . . .

When pupils are asked to break up a total process and describe the various steps involved, they are called upon to concentrate attention on each phase of the whole. They frequently cannot perform the analysis demanded because the whole is a compactly integrated mental act. No clearer evidence of the organic character of mental activity can be supplied than the fact that thinkers do not readily analyze their mental processes. It is true in other spheres as well as in mathematical thinking that individuals are often unaware of the complexity of mental acts which they perform. They think of a mental act as simple in structure because it takes place without division into consciously recognized elements. One reason why teachers have difficulty in understanding the mistakes of pupils is that teachers, like all who have mastered intellectual procedures, often fail to recognize the complex, highly organized character of their own intellectual methods.[11]

Geometry. The study of geometry deals with space and space relations and might well be introduced to the learner before he studies algebra. Each learner is living from day to day in space and dealing with space relationships. Each has some experience in space perception and makes many simple observations and measurements dealing with space experience. However, the learner often has difficulty in bridging the gap between the space experience and training that he already possesses and the highly formalized space structure which confronts him in geometry. Unfortunately, the result may be that in school he proceeds to memorize the elaborate system of abstractions and general-

[11] From Breslich, *op. cit.*

izations that have been worked out rather than to attempt to discover relationships through reflective thinking as he learns the underlying concepts involved.

If the learner is to gain mastery in his study of geometry he can be expected to achieve the ability (1) to understand and interpret the theorems presented in the text, and (2) to analyze and solve the original exercises. His success depends upon his ability to use the necessary tools — knowledge of the language of the subject and the symbols. Careful and exact thinking situations are provided in geometry and the learner should be given numerous opportunities to do reflective thinking as he engages in the study of the subject. The exercises may be graded in difficulty so as to allow for individual differences but, in every instance, thinking rather than memorizing should be the goal. Applications should be made whenever possible, and these should be logical and practical.

Geometry is considered to be a subject peculiarly adapted to the development of exact thinking. It lends itself to mental processes, such as the mastery of symbols, the application of the principles of logic, and reflective thinking concerning geometric data, including geometric problems and hypotheses. When it is properly taught, geometry has transfer value in thinking to the solution of other life problems.[12] According to Wrightstone,

> The new approach in geometry emphasizes: (a) the development of geometric concepts and principles by the individual and by the group in discussion, with special emphasis upon a creative type of logical thinking; and (b) the utilization of non-geometric reasoning situations for introducing, clarifying, and applying logical concepts.
>
> Several studies have shown consistently that not only are students who are taught by this newer method as competent as students in conventional geometry instruction, but also that they have made additional gains in a transfer of powers of thinking to non-geometric situations and problems.[13]

[12] See H. P. Fawcett, *The Nature of Proof*, Thirteenth Yearbook of the National Council of Teachers of Mathematics. Bureau of Publications, Teachers College, Columbia University, 1938.

[13] From J. W. Wrightstone, "Psychology of the School Subjects," in *Elementary Educational Psychology*, Second Edition, edited by C. E. Skinner, p. 375. Copyright, 1950, by Prentice-Hall, Inc.

QUESTIONS AND TOPICS · FOR DISCUSSION

1. Why should formal arithmetic not be introduced in the first grade of the elementary school?
2. What seems to be the optimal mental age for the introduction of the various processes in arithmetic?
3. What use should be made of drill in the teaching of mathematics?
4. What are the values that can result from basing teaching and learning in arithmetic upon practical applications?
5. By example show how a child begins to achieve his understanding of number.
6. How do you feel about certain specific numbers? Select several numbers and explain your attitude toward them.
7. To what extent is algebra more abstract than arithmetic?
8. What is the relationship between mathematics and precise thinking?
9. Explain what is meant by overlearning the number combinations.
10. List some of the number combinations that still seem to be difficult for you. What is your explanation?
11. What difficulties have you encountered in the solution of problems involving mathematical reasoning?
12. Why should there be a high correlation between intelligence and achievement in algebra?
13. To what do you attribute the fact that on the average boys do better in algebra than do girls?
14. If you are driving an automobile and you meet a sign that tells you to keep 75 feet behind the car ahead of you, would you be able to follow this direction? Can you judge the distance above the ground of an airplane when it is flying overhead?
15. Why does geometry lend itself to the development of effective thinking?

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23

DEVELOPING AN UNDERSTANDING OF THE NATURAL AND SOCIAL SCIENCES

T HERE are no subject areas in which observation and experience are more fundamental to the gaining of knowledge and understanding than in the field of the sciences — natural and social. Through the use of scientific procedure, physics, chemistry, biology, anatomy, physiology, astronomy, nature study, and agriculture have yielded valuable data leading to effective living and an understanding of natural phenomena. The social sciences, including history, civics, economics, geography, sociology, and psychology, are developing an extensive and intensive body of data that can be utilized for the improvement of human welfare. There is a growing tendency to apply scientific procedure to the study of human values.

The trained person or the scientist, as he gathers material for expanding man's knowledge, is concerned with the use of facts that may be considered to be free from personal bias. Achievement through the sciences has value only if the results can be checked by others and similar or other conclusions can be reached. The successes being attained daily throughout the world by men of science are not accidental; they represent careful planning and the expenditure of much energy and time. Further, through the recording of investigations and experiments is made possible the preservation of scientific studies and discoveries as a mass of accumulated data upon which can be built from generation to generation a continued expansion of scientific knowledge and its application. In fact, the child of today is acquainted with many

of the phenomena and scientific principles that centuries ago. baffled the scientists themselves.

Teachers of the natural and social sciences must be aware of the fact that learners need to be guided toward the ideas basic to scientific principles rather than merely toward a mastery of the principles or facts themselves. Exact thinking must rest upon the utilization of ideas that are abstract and that are based upon scientific procedures. Hence pupils must learn more than the facts. They must be able, to the best of their ability, to understand and to appreciate scientific abstractions.

LEARNING THE SCIENCES

Science as accumulated experience. Scientific discoveries represent the efforts of a long list of trained workers, with the scientists of one generation basing their studies and investigations upon the data that have been furnished them by their predecessors. Thus, modern scientific knowledge and its application constitute an accumulation of material (1) that has come to us as the result of the work of past scientists, (2) that is being expanded in the present, and (3) that will lead to further investigation and experimentation in the future. Science is not static; it is an ever-enlarging field of discovery and rediscovery.

The comforts and luxuries that we enjoy represent practical applications of scientific discoveries. It is true that whatever changes are made come gradually, yet steady progress has been shown through the ages. For example, the design of the modern airplane represents the scientific thinking and labor of many men, especially since 1903 when the Wright brothers first flew an airplane. What the future will hold in the way of air travel can only be surmised. Modern man does not always appreciate the fact that he has fallen heir to an accumulation of scientific knowledge that he considers commonplace but the significance of which would have startled scientists of two centuries ago.

Progress in the field of the social sciences follows a pattern similar to that of the natural sciences. Social understanding develops slowly but gradually for society as well as for the individual. It is difficult to state definitely at what age a child becomes aware of his social world. Social consciousness may begin early in the life of a child, if and when he becomes aware of himself as an individual among individuals.

Through the study of the natural sciences is increased the learner's knowledge and understanding of the world of nature. Similarly, study in the field of the social sciences should help the learner to appreciate his relationship to the world of human beings — either singly or in organized groups. The child must come to recognize the significance of social interdependence. He must become acquainted with the various types and functions of society. He must know and learn to abide by social sanctions and controls. He must be enabled to adapt to or to resist social pressures and he must be prepared to meet existing social conditions or to help bring about desirable social change. Hence social science can be interpreted to include (1) adaptation to the society in which a person lives and (2) understanding of the basis of a society that is aimed at assuming personal responsibility for its welfare and progress.

Objectives. Although there is an increasing trend toward including more study of science — both natural and social — in the curriculum on all school levels much more could be done. Because of the difficulty of many of the facts involved in these areas of study, there is needed a careful selection of the data and principles to be taught on the lower school levels. As the learner's schooling continues, however, he can be and is introduced to scientific facts and procedures in many areas, culminating in specialization on the college or technical school level.

In the teaching of the sciences attention should be given by the teacher to the following objectives:

1. To encourage a spirit of inquiry.
2. To cultivate an attitude of independent thinking.
3. To awaken an interest in scientific procedure.
4. To instill an attitude of open-mindedness.
5. To reveal fundamental truths.
6. To sensitize pupils to the forces in their environment.
7. To stimulate appreciation of natural and social phenomena.
8. To develop skill in scientific problem solving.

The present-day attitude toward scientific inquiry is basic to the belief that solutions can be found to more and more of the problems that have baffled man through the ages. It is the application of this attitude that is enabling scientists to bring about changes in the natural and social world in terms of the needs and desires of individuals and groups of individuals.

Value of the scientific method. There is a difference between knowledge of scientific facts and understanding of scientific inquiry. In his explanation of the difference that exists between the two, Judd uses the following illustration.

There is a tradition that tells how Archimedes, of Syracuse, discovered how to determine the purity of gold and thus provided science for all time with a method of finding the comparative density of any substance. Hiero, the ruler of Syracuse, had ordered a crown of pure gold. He became suspicious of the metal which was used in the crown that was made for him and appealed to Archimedes to test it. One day, as Archimedes was stepping into his bath, he noticed that he seemed to weigh less in the water than he did in the air. This observation suggested to his trained mind that the weight of any substance can be compared with the weight of an equal bulk of water by measuring the extent to which the weight of the substance is reduced when it is immersed in water. If the ratio of the weight of pure gold to the weight of water has been previously determined, any doubtful specimen of gold can be tested by weighing it first in air and then in water. The story as told relates that Archimedes was so excited when he made this discovery that he jumped out of his bath and ran through the streets naked, shouting, "*Eureka, eureka* [I have found it]." Whatever truth or fiction there is in the tale, it illustrates vividly the fact that the discovery of a method of scientific measurement is enormously more significant than the discovery of any particular fact. Since its discovery in the third century B.C., Archimedes' method of determining the density, or specific gravity, of substances has been used by thousands of scientists in advancing human understanding of all kinds of materials. It is taught in every secondary school where courses are given in the physical sciences. It is a part of the intellectual heritage of the race.[1]

The value of the scientific method of inquiry lies in the fact that it can be applied to many different situations. Generalizations are arrived at through the utilization of this technique. The *discovery* of a new method of scientific inquiry represents a real achievement. However, the *utilization* of the scientific attitude and method of inquiry should be the aim of the teacher and the goal of the learner. Teaching that makes this possible enables learners to develop a habit of thinking that is both logical and psychological.

[1] From C. H. Judd, *Educational Psychology*, pp. 405–406. Copyright, 1939, by Houghton Mifflin Company.

The application of the scientific method of inquiry leads to the discovery of principles or laws. Through observation and collection of data, their classification or organization, their checking, the formulation of generalizations, and the final rechecking of conclusions by himself or others, the natural or social scientist arrives at principles that are correct and usable. The fact that a pendulum of a given length swings back and forth in the same period of time is a principle that was formulated by Galileo as a result of his careful observation of the swinging of a chandelier. The law of diminishing returns was formulated as an economic principle resulting from scientific study. Many scientific principles are in daily use even though the story behind the discovery of the principle is not generally known.

Scientific principles are devised to be used, not merely memorized. The ability to discover relationships among facts has practical significance. For this purpose, from a psychological point of view, the study of the sciences requires the exercise of the higher mental processes — imagination, insight, inference, and reason — which are developed through comparison, analysis, and abstraction.

As an individual develops in his ability to draw upon relevant experiences, he gains in power to combine ideas in his thinking. Learners, therefore, should be trained to use the scientific method in collecting facts, organizing them about the particular problem under consideration, making inferences, reflecting, and generalizing. The understanding of scientific principles, like the principles themselves, results only from carefully planned effort.

The formation of new mental associations is the basis of a new idea or inference. Insight into the solution of a problem may seem to come suddenly, as if by accident. A mechanic hits upon the idea of a gadget that may improve workmanship or cut down time. This insight comes to him as a result of reflecting on the inadequacy of the machinery. An inference does not evolve unless there has been an expenditure of effort toward a solution of the problem. During the thinking process, many false combinations of elements are made and discarded until at last the correct combination is manipulated mentally in such way that the inference fits the situation and is correct.

Difficulties encountered. Language presents a major difficulty in the learning of the sciences. Scientific terms, formulas,

and modes of expression all contribute to the complexity of any one of the sciences. Some teachers and learners make the memorization of a formula an end in itself instead of endowing it with meaning. Unless the teacher is careful with his procedure, he may be unaware of the amount of verbalism that is taking place among his students in the study of the sciences. The teacher should state his questions in such way that the learner will need to respond with ideas rather than with memorized words. True scientific thinking does not take place when the mental response is none other than verbal repetition.

Learners also should be careful not to fall into the habit of making hasty generalizations. This is a danger that needs to be avoided lest the habit of unscientific thinking continue to interfere with the application of scientific procedures in learning as well as in everyday activities. The making of hasty generalizations is indicative of a tendency to follow the line of least resistance in thinking rather than to consider fully all the available data and their implications before a conclusion is formulated.

Tyler reports the results of a study in which data were obtained from students taking college courses in certain natural and social sciences. Interviews with the college students indicated that many of them (60 per cent) believed that their chief duty was to memorize information considered by their instructors to be important. Their reactions were checked further by means of tests in various subjects, including botany, chemistry, economics, geography, history, and home economics. According to Tyler,

> In each course three tests were given. The first test required the students to recall information taught in the course; the second test required both recall of principles taught and their application to situations that had not been presented during the course; the third test required the students to draw inferences from data that had not been presented to them before. . . .
>
> Many students develop, as the results show, a high degree of ability in mere recall without acquiring great facility in application. Since the two types of tests required recall of information and one required application in addition to recall, the relatively low correlations show clearly that application is a mental process different from mere recall. . . .
>
> It is clear that students may acquire a large amount of information in a course and fail to develop ability to draw inferences from new data.

Emphasis on recall of information does not guarantee the development of the higher mental power of drawing inferences.[2]

THE NATURAL SCIENCES
IN THE ELEMENTARY SCHOOL

Objectives. The natural sciences offer a definite challenge to the elementary school pupil. Great progress has been made in attempting to meet adequately learner needs on the elementary school level. Many of the questions which children ask deal with scientific material. The child wants to know about living things: vegetables, trees, plants, birds, animals, babies, and the like. With this interest as a beginning point, the objectives of elementary science for each child include:

1. Satisfying his curiosity about natural phenomena.
2. Interpreting for him the value of scientific methods in numerous everyday life experiences, such as preservation of food, transportation and communication systems, and similar common phenomena.
3. Discovering with him the importance of health and safety measures.
4. Acquainting him with the social and economic changes that have resulted from advances in science.
5. Impressing him with the fact that control of the environment is made possible through the application of science.
6. Developing in him a scientific attitude toward people and things.

Importance of scientific attitude. The child should begin early to understand and to apply scientific procedures. He should be encouraged to examine phenomena at first hand, and to analyze and interpret what he observes. At times a child may seem to be cruel in his dealings with other forms of life. Ordinarily he is not deliberately destructive. As he tears flowers apart or teases animals he is attempting to satisfy his urge to find out all he can about them. It is possible, through correct teaching, to develop within the child an attitude of preservation of and care for living things.

In the development of scientific thinking the importance of

[2] From R. W. Tyler, "The Relation Between Recall and Higher Mental Processes," in C. H. Judd *et al.*, *Education as Cultivation of the Higher Mental Processes*, pp. 6–14. By permission of The Macmillan Company, Publishers.

observation must not be overlooked nor the value of the intellectual processes neglected. The growing child not only needs to master facts but should be given experience in the use of scientific procedure in dealing with these facts. Such habits of thinking should be started in the early years with facts that the child can understand and classify, and from which he is able to draw inferences.

Teaching responsibilities. In the field of the natural sciences the country child usually has many opportunities for learning which are denied to the city child. There still are city children who never have seen a live cow. In these cases the teacher, through pictures, slides, motion pictures, and other learning aids, is able to help those whose experience with living things must be obtained vicariously. Learning in this or any other field becomes more realistic for the child to the extent that the teacher acquaints himself with the experiential background of each of his learners and supplements any lacks with as complete and lifelike information as he can secure.

Interesting simplicity is the keynote of science teaching on the lower school levels. The material for study should be graded in difficulty, and the learning units should be based upon the interest and understanding level of the learners. Emphasis should be given to the gaining of personal experience on the part of the learners. Well-directed observation tours; field trips; boat rides; garden excursions; radio, television, and motion picture programs; and the silent film — all should be used to build meaning into the works of nature by which the learners are surrounded. The marvels of scientific achievement also should be investigated with as keen an interest and in as thorough a manner as is possible.

Elementary science usually is learned through reading, observation, oral instruction, or experimentation. Reading, when the text material is worded simply, enables the child to profit from the experience of others. Children show a great and absorbing interest in the many books that are being written on the understanding level of the elementary school learner. Oral instruction is more effective after direct observation or after models have been examined or demonstrations have been presented by the teacher. The inductive approach during the laboratory period is especially effective when it is combined with the deductive method.

Motivation. Pupils should be stimulated to become aware of the natural phenomena in their environment and should be encouraged toward an active attitude in relation to them. In many schools, children are stimulated to notice the birds that appear in their immediate environment at different times in the year, to watch for spring, summer, and autumn flowers, to recognize the significance of various atmospheric conditions and similar observable phenomena. Children also should recognize possible problems requiring solution and should be discouraged from drawing conclusions concerning them until adequate data are secured and classified. When learners are convinced of the value of scientific techniques they want to use them.

In the elementary grades motivation may stem from the questions of the pupils and be carried as far as the members of the class are able to go in an understanding of the phenomena. Studies, however, show that the multiplicity of interests of children makes this difficult.[3] Interests of learners are likely to vary with their experiences. There are wide experiential differences among young people. Some rarely get out of sight of the brick and mortar that comprise their homes; others travel widely and have their curiosity aroused in many areas.

As an aid to reaching the interest level of all learners the teacher can attempt to utilize the broad objectives of science teaching presented by Powers in the *Thirty-First Yearbook of the National Society for the Study of Education*. The first six of the thirty-eight principles and generalizations listed in the report are given below. The value of these objectives lies in the ability of the teacher to develop them inductively in terms of the experiences of the learners; otherwise the learning is limited to facts with little or no motivation.

1. The sun is the chief source of energy for the earth.
2. Through interdependence of species and the struggle for existence a balance tends to be maintained among the many forms of life.
3. The earth's position in relation to the sun and moon is a determining factor of life on earth.
4. All life comes from life and produces its own kind of living organisms.

[3] See H. M. Mahoney, "A Study of the Scientific Interests of the Fourth, Fifth, and Sixth Grade Children of the Public Schools of Flint, Michigan." Master's thesis, University of Michigan, 1933.

5. Matter and energy cannot be created or destroyed, but may be changed from one form to another.
6. Species have survived because of adaptation and adjustments which have fitted them to the conditions under which they live.[4]

THE NATURAL SCIENCES IN HIGH SCHOOL

Techniques. The high school teacher of science is a specialist. Hence he often is interested in making specialists of his students, especially those who appear to succeed well in their study of science. At the same time he may permit the weaker students to fall by the wayside. Much intellectual guidance is needed by the learner in science on the high school level. The principle of integration should be stressed daily, and the previous experiences of the learners should constitute the basis of the teaching. Differences among learners are great and should be recognized. Consequently, much supplementary material will be required as learning aids.

The interest factor is as important on this level as it is on the elementary school level. Because of the more difficult terms that need to be mastered in the study of the sciences in high school, teachers may kill this interest by emphasizing words rather than ideas. Each learner should be motivated adequately so that his mental set will further, not hinder, his learning. Only through his own activity is he enabled to learn either the facts of science or the scientific method of inquiry. Hence the student should be given an opportunity to apply in a practical way the knowledge and skills that he has mastered.

As learning takes place, application should be made to as many life situations as possible to assist in the integration of the specific phases of knowledge learned in school and in the development of ability to generalize from specific data. Scientific principles can be applied or solutions worked out in the school laboratory or in the home. The experiments must be simple so that scientific application can be made to old as well as newly acquired knowledge. Since laboratory exercises are difficult for some learners, the teacher should be ready to assist whenever he is needed. Although careful learner guidance is a teacher requirement for effective learning, the teacher must

[4] From S. R. Powers, "Objectives of Science Teaching in Relation to Aims of Education," *Thirty-First Yearbook of the National Society for the Study of Education,* 1932, Part I, p. 53. Public School Publishing Company, Bloomington, Ill.

avoid doing all the work for the learner. The sciences that are being taught in the high school can make effective use of the laboratory technique. Each of the sciences, however, has its own vocabulary of technical terms and illustrative material peculiar to itself.

In general, in attempting to develop an understanding of the area of science, be it biology, physics, chemistry, or earth science, the teacher should be concerned with the following:

1. Whenever possible, opportunities for direct observation should be made available.
2. Problems for study and experimentation should be utilized. These should be practical and based upon life situations.
3. Wide experience should be provided in problem solving in each of the science areas as this will develop a respect for science and scientific procedure.
4. To as great extent as is possible scientific applications should relate to other phases of school activities.
5. Visual aids should be provided to induce clarity of ideas — understanding rather than verbalism. .
6. Demonstrations should be planned carefully and presented in such way that every pupil can observe what is being done.
7. Democratic situations should be utilized for the development of proper mental sets, scientific attitudes, and appreciation of the value of science.
8. The scientific attitude of inquiry should be emphasized constantly and consistently.

Science lends itself easily to motivation by the alert teacher. The biology teacher has his special equipment, his models, his specimens, etc.; the physics teacher is equipped with material and machines; and the chemistry teacher has his compounds and elements. Any of these can become an immediate source of interest to learners. However, since careful organization of material and well-considered drill are essential to the mastery of science, it is what the teacher does with what he has that counts.

Providing for degree of maturity. Active attention has been directed to the problem of reaching the understanding level of high school learners in science. Textbooks have been written in more understandable language, thus making them

more functional; formal courses have been broken down into simpler or more practical units, such as applied chemistry, home or industrial chemistry and physics, and applied mechanics for slower learners or for those learners who prefer the study of applied science to that of pure science.

Learners should not be expected to master the materials of science beyond the extent of their ability to understand. The differing abilities and interests of high school students can be provided for by the teacher who not only knows science but also knows how to apply scientific procedures in his teaching. If such a teacher fails to reach his students through the use of one technique, he does not rest content with the belief that the learners are at fault. With a renewed energy born of the challenge of apparent failure he experiments until he discovers a technique that is more effective. In the words of Judd, "Instruction in science, like all teaching, involves an adjustment between mature and immature methods of thinking. There is no more striking example of the necessity of attention to psychological processes than that afforded by the scientific subjects taught in the schools." [5]

SOCIAL SCIENCE IN THE ELEMENTARY SCHOOL

Objectives. The elementary school entrant brings with him many acquired social concepts, some of which may constitute serious misconceptions of the world about him. A study by Lacey, based upon 125 concepts included in social studies and 315 meanings associated with these concepts, led to the conclusion that children possess a considerable amount of knowledge concerning their social world. However, prejudices and emotional attitudes may be exhibited early by the young child. With progress through the elementary grades, the child is helped to readjust his thought patterns to the end that his attitudes become more objective with continued study.[6]

The objectives of social science teaching in the elementary school should include:

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[5] From C. H. Judd, *Educational Psychology*, p. 421. Copyright, 1939, by Houghton Mifflin Company.

[6] J. M. Lacey, *Social Studies Concepts of Children in the First Three Grades.* Contributions to Education, No 548. Bureau of Publications, Teachers College, Columbia University, 1932.

1. Stimulating the child toward the development of attitudes of social cooperation, as these are exemplified in respecting authority, caring for bodily health and cleanliness, and accepting responsibility for the welfare of others.
2. Acquainting the child with the fundamentals of history in relation to existing social, civic, and economic conditions.
3. Familiarizing the child with the geographical aspects of the world that are within his limits of understanding.

The mere memorizing of historical and geographical data and of political structure — municipal, state, or national — has little if any effect upon a child's attitudes or behavior. The program of social science on the elementary level should aim to help the child to achieve a simple understanding and evaluation of the primary principles of democratic living.

Teaching techniques. In the social studies on the elementary level it is extremely important that learning begin with the known and proceed in the direction of the less known. Teaching should begin with the child's relations with persons in his home, school, and immediate community. His recognition of his responsibilities as a young citizen should be developed through simple practical applications to his own day-by-day living. The reasons for his assuming such responsibilities should be explained in terms that he can understand.

Local geography should be the point of immediate departure, gradually expanding until simple basic facts concerning physical, political, and economic geography are grasped. The historical development of the United States should be presented in story form, with considerable attention given to the contributions of great leaders. Wars and battle campaigns should not receive undue emphasis. If the material is presented in an appealing fashion, children can be led to appreciate social, political, and economic progress as easily as they can master a specific bit of war strategy. The past should be interpreted in terms of present conditions and future needs.

Although elementary school children cannot be expected to engage in abstract thinking concerning social trends and developments to the extent that is possible for more mature learners, they can be helped to formulate increasingly objective and complex generalizations. An understanding of these will strengthen their conceptional thinking. According to Garrison,

Investigations show that there is also a steady growth in children's social concepts from grade to grade. The child's first perceptions are characterized as simple, concrete, and undifferentiated. Particulars become individualized as a result of experiences with these undifferentiated meanings. Thus, for example, the concept of *democracy* develops into a particular through varied experiences with materials involving the operation of the democratic procedure. These will involve experiences on the playground as well as those in the classroom. Experiences involving decisions and actions arrived at through the will of the majority tend to give meaning and vitality to the concept of the symbol *democracy*. Civic, governmental, political, and other concepts are developed also through the organization of learning units that are at first largely undifferentiated.[7]

First-hand observation and participation in carefully planned projects are as significant in the study of the social sciences as they are for the physical sciences. Visits to local government centers, community agencies, and industrial plants; field trips; the utilization of visual and auditory aids; and the study of well illustrated textbooks, maps, and models are some of the means that are valuable in introducing the growing child to the society of which he is an integral part.

SOCIAL SCIENCE ON THE HIGH SCHOOL LEVEL

Objectives. The fundamental aims underlying the study of the social sciences on the upper school levels differ only in degree and extent from the objectives of elementary school teaching in this area. Since the high school student is a relatively mature thinker he can be led toward a more abstract consideration of the underlying principles of human relationships that are contained in the social sciences. The learner of any age is preparing himself to become an active responsible citizen in his community — either immediate and narrow or remote and expanded. Hence provision should be made for every learner so that he

finally (1) becomes acquainted with the lives of people and therefore more sympathetic toward them and less selfishly egocentric in his outlook; (2) learns the accepted standards of behavior and controls his

[7] From K. C. Garrison, "Learning the Fundamental School Subjects," in C. E. Skinner, editor, *Educational Psychology*, Third Edition, p. 472. Copyright, 1951, by Prentice-Hall, Inc.

own activities accordingly; (3) learns to understand the complex inter-relationships of economic activity; (4) learns to know the structure and problems of government and to function as an intelligent voter and citizen; (5) gains an adequate background of historical knowledge with which to form wide judgments about contemporary events; (6) acquires knowledge of and respect for the rights, privileges, and responsibilities inherent in group living; and (7) develops the useful social skills and right habits of control essential to the dependable and creative citizen.[8]

Teaching techniques. No matter what the study area of the social sciences may be, teaching and learning are centered in human relationships. History is more than a long list of people or events to be memorized in chronological order. It is the story of living, thinking, struggling, failing, and successful people of all nations and all races. In civics, emphasis should not be placed upon mere mastery of technical information but upon the application of civic knowledge in the daily life of the learner. Participation in student government and in community affairs appropriate to the young person's age and legal status is an excellent learning and teaching device.

The personality of the social science teacher is of paramount importance. He should be an example of steadfast loyalty to the democratic ideals embodied in the Constitution of the United States of America. His attitude toward his supervisors, co-workers, and students as well as toward his citizenship responsibilities outside the school should be guided by a sincere and objective appreciation of the power of his leadership potentialities. Not only should he have an extensive and intensive knowledge of the subject matter of the social sciences, but he also must be an unprejudiced, honest, and clear thinker. It is his function to guide his students toward the development of wholesome attitudes and ideals.

The social sciences are fraught with controversial issues that should not be sidetracked by the teacher but should be considered by learners unemotionally and without bias. Unless the teacher possesses great self-control and the ability to think clearly and precisely in terms of a wide background of information, learner reasoning is likely to become confused. Generalizations

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[8] From D. Starch *et al.*, *Psychology in Education*, pp. 471–472. Copyright, 1941, by D. Appleton-Century Company.

may be made by them without adequate bases in fact.

From early childhood onward, an individual should understand and apply the concept of the democratic rights and responsibilities of all people. The one-world concept challenges the teacher to present, in proper perspective, significant historical events and existing interrelationships among differing peoples. Each societal group has something to contribute to other groups. The understanding of human relationships can be furthered through the social studies as learners are apprised of the characteristic attributes of each world group. The teacher should encourage objective, fact-based, and complete discussion on controversial issues.[9]

It is a characteristic of adolescents to become emotionally aroused over human relationships. They are idealistic and possess the urge to reform — to change the "sorry state" of existing conditions to fit a dream world of their own. They often are impatient of the slow social progress made by their elders and they may favor revolution rather than evolution in their great desire to improve the welfare of society. A carefully planned program of the social sciences taught by competent, well-adjusted teachers can do much to harness youthful enthusiasm and guide it in the direction of virile, objective, and democratic leadership.

QUESTIONS AND TOPICS FOR DISCUSSION

1. How significant is the teaching of the natural and social sciences in the elementary school?
2. Why is it important that learners develop the scientific attitude?
3. List some scientific facts that are important in everyday life.
4. Why is it relatively easy to motivate learning in the natural sciences?
5. In what ways do you apply the objectives of scientific inquiry?
6. How can the teacher relate the subject matter of the sciences to community activity?
7. How does social science differ from natural science?
8. What are the chief difficulties in the learning of a science?
9. How much natural and social science should be included in the high school curriculum?
10. What values can be derived from laboratory study?

[9] See A. C. Bining and D. H. Bining, *Teaching Social Studies in Secondary Schools* Third Edition. McGraw-Hill Book Company, 1952.

11. State some of the responsibilities of the teacher of the natural sciences.
12. What fundamental differences are there between the study of the social sciences and the study of the natural sciences?
13. Discuss some of the special problems of the teachers of the social studies that do not arise in the teaching of the natural sciences.
14. Why are the personality characteristics and attitude of a teacher of the social sciences extremely important?
15. How important is formal education in the development of attitudes in social relationships? Illustrate your answer.

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24

THE DEVELOPMENT OF APPRECIATION

Expressions such as "My family does not appreciate me," "He has no sense of the value of money," "True worth is never recognized," "I adore the music of Aïda," or "Tennis is my favorite game," are used commonly to indicate an emotional response toward people, things, or activities. *Appreciation*, in its more correct and comprehensive interpretation, is an experience which includes mental understanding accompanied by an emotional reaction of pleasure or satisfaction. True appreciation lifts an individual above the tangible values associated with everyday life. For example, a convenient system of filing frees the worker for other activities, as does an automatic washing machine. However, as the utilitarian value of the object is recognized, there may be an accompanying appreciation of the master craftsmanship that went into its production.

Appreciation is personal. That which may appeal to one person as of great worth to him both intellectually and emotionally may possess little value for another. As a result of maturity of thinking and background of experience, an individual may become so sensitive to that which is fine and worth while among existing phenomena that he is able to appreciate whatever is best in his cultural heritage, be it literature, music, art, the wonders of nature, or the achievements of man. An immature person may appreciate little, if any, of this heritage.

Intellectual understanding is an essential factor of appreciation. It is possible, however, for a person to comprehend or understand a phenomenon and yet experience little emotional

reaction to it. It also is possible for an individual to be thrilled emotionally by an experience and yet fail to appreciate its true significance. It is when a person is stimulated both mentally and emotionally by that which has real worth or value for him that he is experiencing appreciation in its highest form.

PSYCHOLOGICAL FACTORS

Areas of appreciation. The areas of appreciation have been limited more or less generally by tradition to "subject fields," such as music, pictorial representation or design, and literature. The modern concept of appreciation has expanded to include all areas of human culture. Ideals of human behavior as these represent high conduct values, political and social institutions and customs as they stimulate permanently worth-while modes of living, religious experiences that are aimed at the achievement of spiritual values, music, pictorial representation and design, literature, drama, radio, television, and motion picture programs — all possess elements that have to do with what may be referred to as "good taste" and that arouse appreciative attitudes.

Individual differences. A child is born with the capacity to appreciate the good and the fine in any phase of his life experiences. The type of values to which he eventually responds results from the effect upon him of the environmental influences to which he falls heir. The attitudes that prevail in the child's home, the teaching which he receives at school, and the commercially offered and community organized opportunities by which he is surrounded, all play their part in the development of the young person's aesthetic and idealistic appreciations as he is led to understand them and to respond to them emotionally.

The extent to which an individual can be helped to achieve appreciation on higher levels of understanding is dependent in great part upon the factors of intelligence and age and, to some degree, sex. The values that an individual learns to regard as worth while are conditioned by his mental ability to understand the significance of the elements inherent in the situation to be evaluated. The slower the functioning of the individual's mental processes, the less able he will be to react to those subtle nuances that must be understood to be appreciated fully. The greater the

individual's intellectual capacity the more easily and the more quickly this needed understanding can be gained. There is danger, however, that the highly intelligent person may become so involved in an objective appraisal of a situation, an experience, an object, or a person that he fails to achieve the emotional stirring essential to complete appreciation. Hence emotional sensitivity as well as intellectual awareness needs to be fostered in an individual from young childhood onward if he is to achieve attitudes of appreciation.

The appreciations of the young child are spontaneous and associated with his immediate environment. He responds almost unconsciously to rhythm, balance, and movement. As he matures physically, mentally, and emotionally, and as he is stimulated by more and more complex phenomena, he gradually develops those finer habit patterns of appreciation that tend to persist through life.

The results of investigations seem to show that there are some slight differences between the sexes in appreciation and the value which they attach to that which they experience. To the extent that these apparent differences between the sexes are valid, they may be explained partly in terms of early environmental influences and school experience.

The responsibility of education. Education on all school levels has a tremendous responsibility for the development of appreciative attitudes within each young person to the limit of his capacity. Through the development of an appreciation of the fine and the beautiful in our culture, an individual of any age can be helped to develop self-control, to lessen concern with his own selfish interests, and to raise his behavior patterns to a more socially desirable plane of expression. A committee appointed by the American Council on Education (1938) for the purpose of studying emotion as related to the educative process offered four groups of suggested experiments dealing with the role of the "arts" in education:

The first group of suggested experiments deals with the possible role of the arts in bringing children into the stream of culture and helping them to understand and appreciate different cultural groups and cultural epochs. We should try to give children enough concrete experience in music, poetry, dancing, drama, and the graphic arts to bring them to *feel* the essential features of the culture being studied. . . .

A second area of experimentation deals with the possible role of the aesthetic arts as vehicles for the expression of personal experience, as a means of achieving an essential personality unity by stating clearly through music, dancing, the drama, or the representative arts that which one cannot put clearly in words but which one feels vividly and honestly. . . .

A third area of experimentation involves the use of aesthetic expression or experience as a means of catharsis for the relaxation of emotional tension and as a tonic for restoring or increasing morale, either in individuals or in groups. . . .

The final area of research involving the extension of aesthetics in the curriculum is more technical. It concerns the examination of the aesthetic productions of young people in order to gain insights into their emotional conflicts and personality needs through an understanding of their fantasy life.[1]

During the recent past, various attempts have been made to functionalize the teaching of the arts so that felt appreciation — not mere lip service — may result. In an increasing number of schools, areas of appreciation rather than isolated courses in music, art, or literature, for example, are being introduced. No matter what the particular field of study, the factor of appreciation is present — in mathematics, natural and social sciences, word study, physical education, or any other field. "A thing of beauty is a joy forever," says the poet. A picture, a strain of music, a word well used in its context, good form in any sport, an attractive arrangement of furniture, a pleasing combination of line and color in dress, a well-prepared and tastefully served meal so can stimulate imagination and feeling that they become things of beauty and as such can be appreciated.

If the school is to accept the responsibility of helping young people to develop high standards of appreciation, teachers themselves must possess the ability to appreciate the good and the beautiful, whether it be in the fine and applied arts, music, literature, drama, natural or social science, or any other area of appreciation. Unless teachers understand what they are presenting and feel keenly about it, they can do no more than stimulate their pupils to acquire a patter of high-sounding

phrases concerning aesthetic values that have no real meaning or feeling accompaniment.

It can be recognized that all education should attempt to encourage an appreciative attitude in learning. The following discussion, however, will concern itself primarily with a consideration of those areas of learning that are accepted as dealing principally with the development of appreciation.

APPRECIATION THROUGH ART

The "field" of art. As the term commonly is used, a *work of art* in this area of appreciation is any masterpiece of pictorial representation, design, architecture, or construction that stimulates the visual sense organs and that arouses in the beholder an attitude of deep feeling and appreciation not so much for the work itself as for the meaning attached to it by the person viewing it. Perhaps too sharp a division has been made between the fine arts and the practical or industrial arts. Perspective, balance, rhythm, line, and sometimes color are essential components of any form of pictorial representation, design, or construction. An understanding of these elements, no matter in what form they may be presented, is important if appreciation of artistic effort is to be developed.

Educating for appreciation and creative expression. Young children are eager to express themselves and their ideas through the media of chalk and crayon. Their beginning efforts may seem to the adult crude and without meaning, but to the youngsters themselves their "artistic" products represent spontaneous attempts at self-expression.

Under skillful leadership the early efforts of the child can be guided away from purely free activity toward a more refined creative expression. As the child is stimulated by the observation of artistic models, his own ability to appreciate and to create gradually improves. Not all children possess the same ability to recognize, to reproduce, or to create. Inherited potentialities and environmental influences are responsible for the extent to which the child is ready and able to gain from his school experiences an appreciation of values.

Attitudes in the home are significant. The father of two children known to the authors is himself a keen appreciator of fine artistic production and has superior creative ability. When

his children were little tots, he attached a blackboard to the kitchen door. He then made it an almost daily practice to place, without comment, a simple, often humorous sketch on the blackboard. His children became increasingly eager to see what daddy was drawing. They would watch him at work, chatter about the result, and then attempt to imitate what he had done. The father's remarks concerning their efforts always were encouraging. Apparently both youngsters have inherited some of their father's artistic ability. Their first efforts with chalk on the blackboard gradually were transferred to crayon work on paper. The children vied with each other in producing effective drawings and designs. Self-criticism and criticism by each other and by their parents and friends were engaged in as a matter of course.

By the time these children entered school they had received an excellent background of artistic appreciation and some facility in creation which cause them to delight in all forms of school instruction in the arts. Fortunately, they attend a school in which the teaching is not rigid and formalized. The children are encouraged tactfully by their teachers to build upon their simple background of home training. Now at the age of eleven the girl has developed a commendable degree of appreciation of and creative ability in freehand drawing. Her brother, a lad of ten, is tending, however, toward a greater interest in and ability for line construction and design.

Not all children are as fortunate as these two. A child may have interest and talent, but the family does nothing to encourage him. In school, the teaching may be so formal that a long time may elapse before the sensitive child shows any overt expression of his special interest or ability. Concerning children's incompetency in drawing Judd says:

When children enter school, they are usually enthusiastic about drawing. They will without hesitation try to illustrate a story. . . . The pupils in the first and second grade do not ask for models to copy. . . . They are uninhibited by concern about standards. . . . By the time a child reaches the end of the third grade he is making drawings which are fairly recognizable though still crude as representations of objects. At this juncture a new psychological situation makes itself manifest. The child attempts of his own initiative to follow external models and compares his completed drawings with the objects which they are sup-

posed to represent. . . . The child sees that his drawings are far short of exact reproductions of external objects.[2]

It is at this point that the teacher's attitude toward the child's earlier "artistic" efforts is extremely important. Harsh criticism is likely to discourage the child. Tactful suggestions concerning possible improvements in his work are likely to cause the child to recognize the fact that he is not expected to reproduce exactly, and he will continue in his efforts to improve his own drawings as he appreciates the superior qualities of the model.

Some children find it easier to express themselves through a medium other than pencil, crayon, or paint brush. For them opportunities should be provided for participation in clay modeling, paper cutting, or similar activities. Regardless of the approach, appreciation on the elementary level probably can be developed best through self-creation and by way of exposure to masterpieces of art, copies of which appear on the walls of the classrooms and corridors of the school, as well as by informal visits to art galleries and the utilization of other visual aids. Little in the way of formal study of artistic production is desirable during this period.

It is on the secondary level that an attempt is made to introduce young people to the principles of artistic production. In most school systems there is a course called "art appreciation." The psychological value to an individual student of a course of this kind varies with (1) his own background and developed interest in art; (2) the materials and equipment available for the course; and (3) the teacher's attitude toward the course and his own appreciative and creative abilities.

A course in "appreciation" that consists of class lectures to a large group of students concerning the artistic qualities possessed by exhibited models usually fails to stimulate any real appreciation on the part of the students. If, however, a course of this kind includes simple creation based upon imitation of excellent models, if the students are encouraged to *feel* beauty as well as to recognize it intellectually, if classroom instruction includes the showing of slides or motion pictures dealing with scenic beauty

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[2] From C. H. Judd, *Educational Psychology*, p. 398. Copyright, 1939, by Houghton Mifflin Company. See also F. J. Geck, "The Effectiveness of Adding Kinesthetic to Visual and Auditory Perception in the Teaching of Drawing," *Journal of Educational Research*, XLV: no. 2: 97–101 (October, 1947).

as well as other pictorial representations, if visits are made to art galleries and to neighboring examples of building and bridge construction and other artistic phenomena in the community, not only will such activities appeal to youthful interests but a well-grounded attitude of appreciation will be developed.

The talented students should not be neglected, and special courses should be provided for them. In many schools these courses include training in pencil, pen, charcoal, and paint representation, home, stage, and clothing design, ceramics, and simple construction in wood, metal, and iron.

On any school level, learners in art should begin with simple appreciation and creation, and, as their ability warrants it, should be encouraged to refine their concepts, their attitudes, and their skill in creation. Instruction should be such that art becomes a way of life. Verbal expression does not always represent real attitudes. However, as young people are encouraged to utilize their artistic talents in projects, such as illustrating school newspapers and magazines, planning and preparing posters or stage sets, cooperating in making and keeping their classroom attractive, and giving attention to the artistic effect of their own dress and grooming, they are benefiting from a form of education for appreciation that will be of lasting value to them.

APPRECIATION THROUGH MUSIC

The importance of music. From earliest times onward music has had a universal appeal. Each culture has developed its own musical forms and "tastes." The young child appears to respond naturally to rhythm. Much of his beginning responses, however, seems to resemble somewhat the behavior of the early peoples. He "dances," jumps up and down, smiles, and may even clap his hands as he is stimulated by simple, stirring music in which the rhythm is pronounced. As he grows a little older he wants to "sing" to the music that he hears. His efforts may result in no more than a humming or a continuity of sounds that may or may not be in accord with the music itself. He likes to produce his own music. The banging together of two metal pot covers or noise making on the piano affords him great pleasure.

This interest in musical stimulation continues throughout the life of the individual. He gradually comes to respond to refined

combinations of musical sound that require greater comprehension for appreciation. However, musical tastes differ among people of all ages, regardless of the musical training to which they may have been exposed. Some are stimulated by relatively primitive music, others appreciate rhythm rather than quality of tone, still others find their greatest satisfaction in the harmonious blending of tones that can be found in the more complex forms of musical composition.

Psychological factors in music education. Since music is so much a part of the life of every individual, it is important that music education be aimed primarily at the refinement of appreciation. Not every young person has sufficient musical talent to become a finished singer or a skilled performer on a musical instrument. Parents often cause real suffering to their children by forcing them to take "music lessons." For interested and able pupils more and more schools are offering such training through the organization of school bands, orchestras, and choral groups as well as by individual instruction. For the majority of young people, however, emphasis should be placed upon encouraging them to appreciate fine music as it is listened to over the radio, at special musical performances, or in home or community group singing or playing.

Learning in music should begin with the singing of simple rote songs. As the child matures and his auditory perceptions become more refined, he gradually gains the ability to recognize differences in time, pitch, and tone quality. However, as in other areas of learning, readiness for singing at sight or for appreciating relatively complex harmonies varies not only with age but also with intelligence, auditory acuity, and musical background.

The results of studies of musical ability among children would seem to indicate that standards set by schools go beyond the ability of many children to meet them successfully. Most pupils do not gain proficiency in sight reading until they reach high school. Progress in musical knowledge is irregular for most children, and girls seem to be at least a grade ahead of boys in their musical achievement.[3]

On the elementary school level, music appreciation is developed

[3] See J. Kwalwasser, *Problems in Public School Music*. M. Witmark and Sons, New York, 1932.

somewhat in the same way as is appreciation of the representative arts. Courses in music appreciation are offered in the majority of secondary schools. Some of these courses are boring to the students, and little real appreciation results. There are teachers of music, however, who themselves are thoroughly imbued with an appreciation of beauty in music and who also are trained performers. By utilizing in the classroom phonographic recordings, radio programs, and their own vocal or instrumental performances they are able to inspire in their students a commendable appreciation of the best in music. As these teachers combine excellent classroom leadership with visits on the part of the class to music programs outside the school, they are helping young people to recognize the value of music, to interpret what the great musicians have tried to portray in their compositions, and to experience the relaxing and stimulating effects upon the emotions of the work of great masters.

APPRECIATION THROUGH LITERATURE

Present status. Never before have there been available for consumption so many different kinds of reading material as can be found at present. Newsstands offer a huge array of newspapers and magazines. The shelves of bookstores are filled with fiction and nonfiction of every description, aimed at meeting any or all interests of the reading public. Truly one can say of the writing and consuming of written material that there is no end. The problem of young and old has become not one of finding something to read but of selecting what one shall read from the great wealth of offerings that is available.

Criticism has arisen recently concerning the reading tastes of the mass of the American people. Deplored by the critics is the apparently growing tendency on the part of adolescents as well as adults to limit their leisure-time reading to so-called "escape literature" — thrillers, mystery stories, sentimental love stories, and pulp magazines. The schools are being blamed for failing to develop in their pupils an appreciation of good literature, that is, nontechnical writings that embody worthy sentiments written in acceptable or superior form.

Perhaps the critics are a little too severe. It cannot be disputed that much is read which is distinctly nonliterary. How-

ever, there are many evidences, such as the sales reports of publishers and reviews of new books, that the American people are readers of good literature and in many cases are keen and understanding critics of the "best" in literary production.

Psychological factors affecting literary appreciation. Individuals differ in their reading tastes on the bases of stage of maturity, sex, intelligence, and reading background. Young children like stories about other boys and girls, animals, and experiences similar to their own. They also carry their concern with fantasy into their reading and story-telling interests. Whether fairy tales are desirable for children or not, they are very popular.

As children grow older there seem to be differences in reading interests between boys and girls. Boys (and men) appear to devote much of their reading time to books and articles dealing with science, current events, sports, and their particular occupational activities. Although members of the male sex also may read literary fiction and poetry, they are much less likely to be interested in the love theme than are girls. However, both boys and girls acquire their reading tastes from the examples set for them by their elders.

Degree of mental alertness, as this is reflected in command of a reading vocabulary and individual ability to put meaning into what is read, greatly influences what one reads or what reading material one can be helped to appreciate. The content as well as the form of the literary masterpiece may go beyond the slow reader's power of comprehension and consequent appreciation. Contrariwise, many bright young people are able to appreciate literature that has been written on the adult level.

Home attitudes toward reading also exert a powerful influence upon the reading interests of children. A child who is reared in a home in which good books are treated as prized friends develops a readiness to enjoy and to appreciate good literature during his school years. The child in whose home little or no reading material is available except the daily newspaper and the pulp magazine is entering a new field of experience when he is expected to "enjoy" a higher form of reading material as a part of his school training.

Literary appreciation is a personal matter and cannot be forced. Nor can it be measured except through observation of

what an individual selects to read when he is free to choose for himself. This is a fact that is of utmost importance to teachers of literature. It is almost axiomatic that literature should be studied for appreciation and not used as a medium for exercise in outlining or practice in grammatical analysis or syntax. Too great concern with the preciseness of definition of words that appear in a selection read in the classroom may kill appreciation of the beauty of the passage, even though the learner's vocabulary thereby may be improved. This does not mean that some words in a passage may not need explanation to be understood, but word analysis should be a means of clarifying the meaning rather than an end in itself.

It is a known fact that many high school students rarely select on their own initiative a book for reading enjoyment written by the author of a literary masterpiece "studied" in school. Spending many weeks in the analysis of the minute details of a book that may have been read with keen enjoyment when the student read it for the first time destroys whatever appreciation he may have gained from the first reading.

Also, the standard works of literature may be too difficult for an immature reader. For example, Scott's *Ivanhoe* offers much in the way of literary value to the mature reader. Utilized as a reading assignment in first or second year English classes, the study of *Ivanhoe* strains the ingenuity of the teacher and often reduces learners to a state of complete boredom or bewilderment, if not actual dislike. Frederick H. Law, for many years associated with the teaching of English in the New York City high schools, was a pioneer in the belief that the teaching of literary appreciation should begin with the interest level of the learner. If a boy is passing through the "thriller" stage exemplified in the once famous Nick Carter series, let him start with books of that type. Gradually stimulate him with other stories similar in character but on a little higher literary level until the boy has matured sufficiently to appreciate the fine in literature.

The alert teacher who himself is a lover of good literature can utilize many ingenious devices in his efforts to develop good taste in reading. It is of prime importance that the book, poem, or story selected be within the comprehension range of the learner. Oral reading of well-written prose passages or of beautiful bits of poetry, sometimes without comment; simple dramatization of

sections of a book that lend themselves to this treatment; interpretation of the incidents, situations, or characters of the book in terms of modern experiences, conditions, or people; encouragement of the reading by pupils of other writings by the same author (many now available in inexpensive form); attendance at well-prepared motion picture productions of standard classics, and utilization of televised dramatic performances in the classroom are but a few of the ways that can be employed by teachers to make literature live. The average young person can be guided — not forced — into an appreciation of literary values that will cause him to spurn the dross and select the gold in the great mass of reading material by which he is surrounded.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Distinguish between practical values and appreciative values.
2. Defend the thesis that appreciation is a fundamental phase of an individual's personality.
3. What relationship exists between intellectual understanding and emotional enjoyment?
4. Give examples of appreciative values that can be found in the areas of the natural sciences, the social sciences, and mathematics.
5. To what extent is ability to appreciate related to ability to create?
6. From your own experience cite examples of the effect of (1) degree of mental ability, (2) sex, (3) environmental influences upon individual ability to appreciate in the fields of music, the fine arts, and literature respectively.
7. Discuss the relationship between appreciation and knowledge of the titles and authors of artistic masterpieces.
8. Review your own experiences on the high school level in the development of musical appreciation. What values did you receive from the instruction given?
9. Show the value of the utilization of visual and auditory aids in the development of appreciation.
10. Defend your own tastes in music, art, and literature.

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25

EDUCATING FOR HEALTH AND SAFETY

HEALTH and physical fitness are ideals toward the realization of which man has been striving for generations. Although they have recognized the importance of health and physical vigor, educators have been slow in fully appreciating the significance of learning areas dealing with health education as a part of the curriculum. The poor physical condition of many young men at the beginning of World War I led to a greater understanding of the value of health education. Discoveries relative to physical fitness during World War II have emphasized the need for an increased interest and better program in these study areas. Not only should young people know good health measures, but they should want to practice them.

INTERPRETATION OF HEALTH AND PHYSICAL EDUCATION

The meaning of health and the interpretation of health education and of physical education are stated clearly in the following definitions:

Health

Health in the human organism is that condition that permits optimal functioning of the individual, enabling him to live most and to serve best in personal and social relationships.[1]

[1] Quoted from H. N. Smith and H. L. Coops, *Physical and Health Education*, p. 5. American Book Company, New York, 1938. (These are the definitions given in "Definitions of Terms in Health Education," *Journal of Health and Physical Education.* V:no. 10:16–17 (December, 1934).

Health Education

Health education is the sum of all experiences which favorably influence habits, attitudes, and knowledge relating to individual, community, and racial health.[1]

School Health Education

School health education is that part of health education that takes place in school or through efforts organized and conducted by school personnel.[1]

Public Health Education

Public health education is that part of health education that takes place in home and community through both private and public channels.[1]

Physical Education

Physical education is that phase of education that deals primarily with large muscle activities and is designed to provide for the individual opportunity for wholesome psychomotor or organic development, training in suitable social conduct, and a satisfying repertoire of skills for practice in leisure time.

Athletic Play Activities: Games and Sports
1. Simple games of low degree of skill
2. Athletic activities of high degree of skill
3. Individual and partner sports
4. Self-testing activities

Dance and Dramatic Activities: Rhythmic Forms
1. Child rhythms
2. Dance forms
3. Festivals and pageants

Related Physical Education Activities
1. Corrective gymnastics
2. Camping activities
3. Recreational activities
4. Organized club activities [2]

Health education has to do with the health status of the whole individual; physical education deals mainly with activities requiring physical strength, skill, and endurance as these operate in connection with the mental processes involved in sensori-motor learning. The development of health habits, both physical and mental, is the goal of a good program of health and physical education.

The American Association for Health, Physical Education, and Recreation, and the Educational Policies Commission of

[1] See footnote 1 on p. 484. [2] Ibid., p. 19.

the National Education Association recently outlined a program for the health and physical fitness of all our children. They report as follows:

We hold that all American children should have the opportunity to grow in health and physical fitness.

To this end we recommend nationwide provision for the following minimal program for every child in our country, whether in a large city, a small town, or on the farm:

1. A complete physical examination at least once in each two years, including careful attention to vision, hearing, and teeth.
2. Prompt and persistent follow-up of the physical examination, with successful provision for all needed corrective and protective measures.
3. Instruction based on scientific information which will lead to the formation of desirable habits, attitudes, and appreciations in physical and mental health.
4. Special instruction in diet, with provision of at least one appetizing, wholesome meal each day, provided by the school if necessary.
5. Opportunities for play and exercise which will provide needed physical activity and develop good muscular coordination.
6. Participation in a rounded program of recreational activities which will carry over into after-school life.[3]

The schools are in a favorable position to stimulate the development of the health and physical fitness of young people and to provide recreational activities and programs of safety education for all children. In Cincinnati, Ohio, it is expected that by the time a child has finished the sixth grade he will have developed the following knowledge, skills, and attitudes:

Knows the value of team play.
Has learned to play many nationally popular games.
Has developed social characteristics of kindness, courtesy, self-sacrifice, loyalty, cooperation, and honesty.
Is able to assume squad and group leadership.
Has developed alertness and quick response in games.
Has proper attitudes toward winning and losing.
Knows how and why to exercise at home.

[3] From Educational Policies Commission and the American Association for Health, Physical Education, and Recreation, *Health and Physical Fitness for All American Children and Youth*, p. 3. The Commission, Washington, D. C., 1946.

Has the knowledge of and ability to do at least twenty fundamental steps and nine folk dances.

Appreciates the importance of strength and skill.

Manipulates body skillfully in suspension.

Knows the physical achievement tests for his group.

Knows the track and stunt meet activities.

Knows how to correct own posture.

Knows the conditions which cause poor posture.[4]

EDUCATING FOR HEALTH

Existing needs. In 1944 the United States Children's Bureau estimated that ten million boys and girls under twenty-one were suffering from defective vision and two million from impaired hearing, including almost 17,000 deaf children. About three out of four children had dental defects and almost half a million gave evidence of orthopedic defects or spastic conditions. Almost a million children were believed to be affected by congenital syphilis. The possible correction of these conditions can be facilitated by prompt identification and treatment. Attention to physical defects and poor health conditions not only gives strength and happiness to afflicted individuals but also influences the strength and power of a nation.

Psychological factors — health education. A child's physical condition affects all of his daily activities in school and out. Contrariwise, certain school activities, such as testing programs and the amount and kind of homework assigned, may also influence the health of children and their developing attitudes. The child's health, mental development, emotional stability, and personal adjustment should be the responsibility of the school. Health instruction should have an important place in the curriculum and not be reduced to the status of becoming a poor substitute for outdoor physical exercise.

Good health must be preserved and ill health prevented. All the health factors that lie within the individual and in his environment should be brought into focus and included in a program designed to develop good health habits and practices. The school plant and equipment must be so constructed that there is sufficient light and air, that conditions are sanitary, and that accident hazards are reduced to a minimum.

[4] From *The Intermediate Manual,* Curriculum Bulletin No. 125, p. 294. Cincinnati Public Schools, 1945.

A physical or medical examination should be administered to each learner at least once a year. This practice serves to protect the individual and others from the spread of contagion and infection in the school. Good food at home and at school, cleanliness, and adequate sleep also are essential to the preservation of excellent health.

Health knowledge becomes functional for a learner only after it becomes a part of his habitual experiences. It is psychologically sound, then, for an individual not only *to know* health rules but *to practice* them. The transfer from knowing to doing is an important aspect of good health education. The development of desirable attitudes toward health and of health habits and skills follows psychological principles utilized in other learning areas, i.e., motivation of the activity and effective practice with satisfaction.

Psychological factors — physical education. Physical education as an adjunct of health education also is concerned with the improvement of health and the development of the total personality. Techniques must be learned and mastered, habits established, skills perfected, attitudes developed. The psychological factors basic to the teaching of physical education can be summarized as follows:

1. Activities that are appropriate to the capacity and ability of the learner should be organized according to his age, sex, level of training, interests, and needs.
2. The learner must be able to comprehend the essential elements of the physical activity engaged in.
3. Essential skills should be made habitual and automatic through effective practice.
4. There must be an awareness on the part of the teacher that attitude and habitual behavior influence the development of skills.
5. Motivation serves the learner in his initial activity as well as in his continued practice until a high degree of skill is attained.
6. Activities that provide satisfaction to the learner encourage him to continue them, whether the satisfactions or rewards are immediate or remote, tangible or intangible.

The amount of practice, the distribution of practice periods, and the utilization of the "whole" versus the "part" method of

learning are significant factors in the attainment of skill in any physical activity. Short, frequent, well-spaced training periods during which the activity is engaged in enthusiastically generally are considered to be more effective than long, continuous practice periods. More attention might well be given to the spacing of the practice than to the amount of practice itself. It usually is better to attempt to master the whole of a physical skill, with special practice in specific weaknesses, than to perfect each part and then try to piece together the separate skills. For example, a golfer plays the entire game, but as he discovers his specific weaknesses he gives special attention to them — intensive practice in putting, driving, or approaching.

In order to develop among young people favorable attitudes toward physical exercises, the play attitude should be introduced whenever and wherever possible. Spontaneous activity is health-inducing since it stimulates the individual toward a desire to use his energies in such activities because of the pleasure experienced. As the activities are graded in terms of age, sex, environment, and traditional interests, they allow for enjoyment at all age and interest levels. Through play the individual not only develops his physical condition but also learns the value of fair play and sportsmanship. Through participation in physical activities that have a play aspect, social attitudes are strengthened and a healthy outlook on life is fostered.

Special considerations in health and physical education. Exercise that is suited to one's physical constitution serves to preserve health and prevent disease. Physical training no longer is or should be limited to calisthenics or setting-up exercises. However, some formal apparatus and floor work is desirable. Free play, organized games, swimming, rhythmic exercises, and folk dancing are regarded by school people as meeting the attitude and exercise needs of the child. Whenever it is possible, these activities should be engaged in out of doors, so that fresh air and sunshine can do their part in health building.

The development of desirable attitudes toward healthful living is most important. The knowledge of facts concerning good health habits is valuable but this knowledge needs to be supplemented at home and at school by helpful guidance toward the practice of good health habits. An understanding of the reasons for the practice of these habits should be an integral

part of teaching. To ensure that these habits become permanent there also should be a continuous checking up of the learner's progress.

The extent to which a school program of health education should include sex education is a question concerning which educators disagree among themselves. Many parents, believing that they are not qualified to present the subject properly, hesitate to give sex education to their children. In spite of their own lack of ability or unwillingness to take the responsibility for this area of their children's training, some of these parents question the desirability of the school's taking over this important but emotionally charged phase of education.

Undeniably, sex education for both parents and children is needed. The form that it should take, the time and place of its giving, the material to be included still are in the area of uncertainty. However, several excellent books on the subject are available for parents. Also, as more and more teachers are better trained much can be done by the school in the area of attitude development along with a consideration of the physiological and health factors associated with sex.

Most children receive information about sex matters in one way or another. If children are to be prepared for the onslaught of pubescence, it is someone's duty to give them sound and accurate information so that their health will be preserved and their attitudes will reflect objective understanding and respect for themselves and others. Parents and school people, working together, can meet this important challenge through individual instruction in the home as the child matures and through courses in biology, nature study, and social hygiene, with the subject matter suited to the maturity level of the members of the group. The teacher is an important factor in these learning areas. The attitudes that are developed by pupils toward sex often reflect the teacher's attitudes as he presents physical facts with their personal and social implications and stimulates pupil discussion concerning these personal matters.

Although attention to the values of "clean" living can be focalized more sharply perhaps through instruction that deals specifically with sex education, certain basic principles underlie the organization and administration of an adequate program of health education. These include the following:

1. The program should be functional — suited to the age, interest, health needs, and stage of physical and mental development of the learner.
2. Wholesome activity should be included in both curricular and cocurricular projects.
3. Personality traits should be encouraged that are in accordance with acceptable social standards.
4. Health habits learned in one area should be carried over into all areas in which the child finds himself.
5. Teachers should be emotionally stable and well trained for their work.
6. Health instruction and health service should go hand in hand.

SAFETY EDUCATION

Importance of safety education. Since the preservation of good health is dependent in part upon the avoidance of accidents, the attention that is being given to safety measures in education is to be commended. The possibility of accident is a potential danger at all times. An appreciation of the significance of the problem may be obtained from a consideration of four reports concerning accidents among children of school age in New York City.

Among the general population, the home is the source of the greatest number of accidents. Carelessness on the part of older members of the family is responsible for the majority of accidental fatalities suffered by young children in the home. In Table XIII can be found some of the major causes of the home accidents.

TABLE XIII. *Distribution of 286 Home Accidental Fatalities to 5- to 14-Year-Olds in New York City for Seven-Year Period 1937–1943, by Type and Per Cent*

TYPE OF ACCIDENT	PER CENT
Falls	41
Burns (all types)	32
Poisonous gas	6
Firearms	3
Poisoning (not gas)	1
Others	17
Total	100

From Board of Education of the City of New York, *Safety Education in the Elementary and Junior High School Grades*, p. 19. Curriculum Bulletin Number 4, 1946–1947.

However, as we all know, accidents occur outside as well as within the home. In Table XIV is presented the distribution of accidental fatalities among young people outside the home during a seven-year period.

TABLE XIV. *Distribution of 1,281 Accidental Fatalities among 5- to 14-Year-Olds in New York City for Seven-Year Period 1937–1943, by Type and Per Cent*

TYPE	PER CENT
Motor vehicle	46
Falls	16
Drowning	12
Burns	9
Railroad — street car	3
Poisonous gas	1
Firearms	1
Others	12
Total	100

From Board of Education of the City of New York, *op. cit.*, p. 19.

By the time children are old enough to travel unescorted through the streets of a busy city, they should have learned to exercise great care and watchfulness. Table XV shows the serious consequences that may result from carelessness about

TABLE XV. *Distribution of 3,753 Street Accidents to 5- to 16-Year-Olds for Period September, 1943–August, 1944, by Cause and Per Cent*

CAUSE OF ACCIDENT	PER CENT
Running in roadway (street)	25
Crossing (not at crossing)	17
Crossing (past parked auto)	9
Collision of vehicles	8
Crossing against lights	7
Playing in roadway (street)	7
Careless bicycle riding	7
Stealing rides (auto, bus, etc.)	5
Various causes at crossing	3
Roller skating in roadway (street)	3
Coasting (sled, toy wagon, etc.)	1
Other causes	8
Total	100

From Board of Education of the City of New York, *op. cit.*, p. 20.

PER CENT

AREA		

Gymnasium — 20.5
Stairs-Steps — 16.3
Classroom-Auditorium — 15.2
Playgrounds — 14.4
Shops — 9.2
Halls-Corridors — 6.2
Dressing-Wash Rooms — 4.4
Cafeteria-Kitchen — 4.3
Laboratories — 2.9
Street near Grounds — 2.4
Office, Library, Infirmary — 2.4
Engine-Room-Basement — 1.0
Swimming Pool — 0.8

Half of All School Building Accidents Occur in the Gym, on Stairs, and in Classrooms.
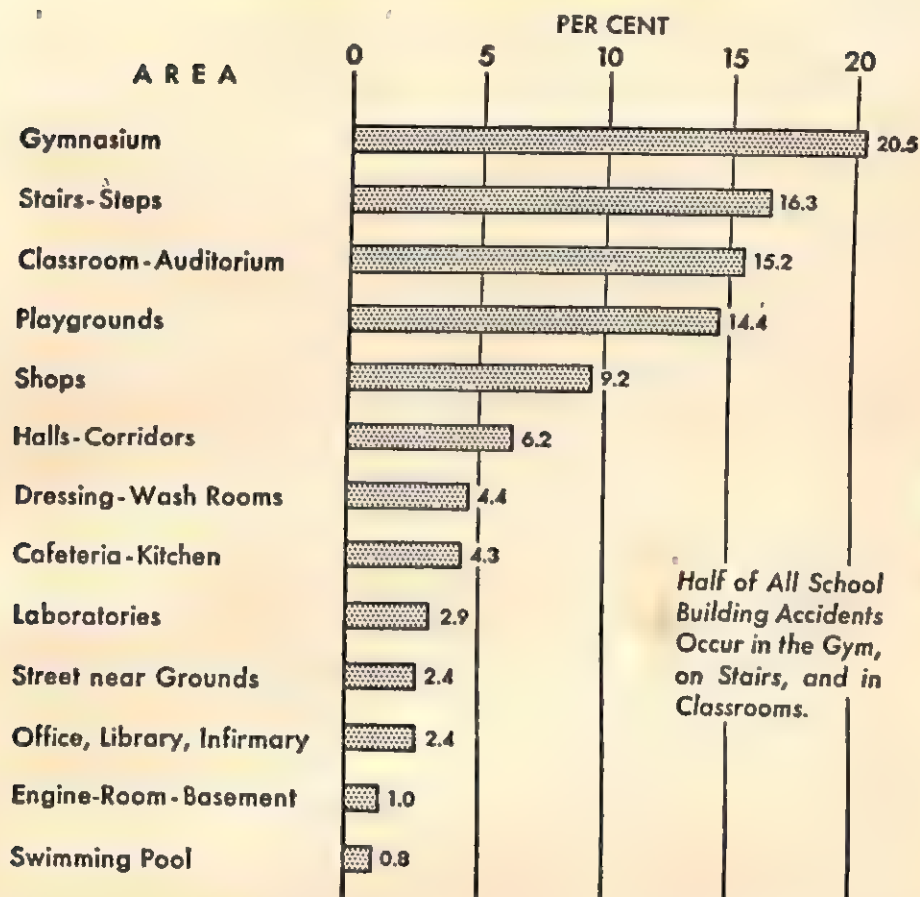
SAFETY EDUCATION PROJECT
N.Y.C. Schools-G.N.Y. Safety Council
N.Y.U. Center for Safety Education

Source-Original Accident Reports
N.Y.C. Board of Education

FIGURE 29. *Distribution of Accidents by School Areas*

From Board of Education of the City of New York, *Safety Education in the Elementary and Junior High School Grades*, p. 19. Curriculum Bulletin Number 4, 1946–1947.

crossing streets against traffic lights, playing in the streets, and similar street and highway activities.

The school building and its grounds are the scene of numerous accidents among school children. Of these accidents, 83 per cent occur in the building itself, 14 per cent on the school grounds, and 3 per cent in the immediate school vicinity. Hence it is extremely important not only that school children be taught habits of carefulness but that teachers and other members of the school personnel constantly be on the alert so that accident-provoking situations are reduced to a minimum. In Figure 29 is presented the distribution of accidents by school areas.

It is evident from the data presented that some areas in the community as well as in the school are greater danger zones than others. Regardless of the danger zone, the majority of accidents experienced by young people have their origin in the behavior of the children themselves. The study of the causes of school accidents reveals that almost two-thirds of the reported accidents occurred in situations involving contact with sharp objects, being struck by an object, tripping, slipping, and falling, and collision with an obstacle — an object or a person.

The specific objectives of safety education in the elementary grades as presented by the Curriculum Council of the New York City Board of Education are presented below:

To help children recognize situations involving hazards.

To develop habits of conduct which will enable children to meet situations of daily life with as little danger as possible to themselves and others.

To develop habits of carefulness and obedience to safety rules at home, on the street, in school, or at play.

To teach children to read, understand, and obey safety rules and regulations.

To teach children safe conduct in the use of street cars, private automobiles, and buses — public and private.

To develop habits of orderliness and carefulness in the use of playthings, tools, common articles in the home and school, and in the use of fire.

To develop alertness, agility, and muscular control through rhythmic exercise, play, games, and other physical activities.

To teach children to cooperate to prevent accidents and avoid unnecessary risks.

To develop wholesome attitudes concerning (a) law and law enforcement officers, (b) the safety of self and others, and (c) organized efforts to assure safety for all.

To give child actual experiences in desirable safety practices.[5]

As young people progress through the junior and senior high school, continued attention is given to the realization of these aims. In the teaching of various subject areas, such as health education, home economics, civics, and related fields, emphasis should be placed upon the importance to the individual and to the community of strict observance of safety measures in all areas of living.

[5] Board of Education of the City of New York, *op. cit.*, p. 27.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Why is it important that individuals should receive correct health information as they progress through school and life?
2. How would you correct misinformation about health?
3. How much health and physical education have you had?
4. How can skill in game activities promote social attitudes?
5. What are the values that accrue to individuals who participate in professional sports? in interschool sports? in intramural sports?
6. By what health objectives is your health practice guided?
7. How important is motivation in the development of skill in games?
8. What are the essential conditions for the development of good health habits?
9. Upon what does degree of motor skill depend?
10. List ten health habits that should be possessed by individuals of high school age?
11. What help do learners need in the development of health habits as they progress through school?
12. Why is the practice of health rules as important as knowledge of the rules, if not more so?
13. Name some safety measures that should be taught in the school. Evaluate the objectives of safety education in New York City as outlined in the Curriculum Bulletin, Number 4.
14. To what extent should adolescents be informed relative to the dangers of syphilis?
15. How is the problem of sex connected with that of health education?

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26

VOCATIONAL EXPLORATION AND PREPARATION

Oₙₑ of the most serious problems confronting young people is that of making a suitable vocational choice. Many factors must be taken into account if the final selection is to be satisfactory. Much individual guidance by trained persons is needed. A complete discussion of the psychological bases of career selection, preparation, and adjustment would demand a treatment which goes beyond the purposes of this chapter. Hence there will be presented briefly some of the fundamental psychological principles involved in general and specific vocational exploration and preparation.

General psychological factors. Intelligence, sex, physical condition, special aptitude, personal interest, the influence of the home and of the school, and availability of occupational placement all play their specific parts in determining the vocation best suited to the needs of a young person and of the society which he shall serve. Until recently, pupils on the senior high school level were given some training in specific occupational fields. The general practice was to encourage intellectually superior students to elect the college preparatory curriculum. Students of average intelligence were expected to prepare themselves for business or similar occupational activities. The less able were advised to take courses on the industrial level. Those who seemed hopeless soon found themselves in unskilled labor.

At present, a different attitude prevails. There is growing recognition among school people that all young people, regard-

less of their intelligence level, sex, and other psychological factors can benefit from experience in what might be referred to as survey courses for vocational orientation or exploration. By way of such courses students become acquainted with many broad aspects of producer, distributor, and consumer relationships. The value to the student — bright or dull — of participation in general vocational orientation cannot be minimized.

As young people attempt to find a place for themselves in the world of work, they encounter problems that are associated with (1) selection of a vocation, (2) training and placement, and (3) job relationships. Vocational guidance is becoming an increasingly important aspect of secondary school education. The modern trend toward occupational specialization necessitates the schools' providing information concerning specific job requirements in terms of personal qualifications.

Parental ambitions and youthful interests (sometimes unrealistic) constitute challenges to school advisers. Oversupply and undersupply in various occupational fields also are significant factors of vocational selection. After young people have been aided in their selection of a vocation, they want to know about the kind, amount, and availability of needed preparation, as well as about placement and advancement opportunities. Regardless of the occupation selected and entered, success in it depends not only upon skill of performance but also upon human relationships.[1]

Besides this general survey approach there also are offered to students in some junior and senior high schools further opportunities to discover their own fitness for and interest in one or another of the many occupational fields that later may be open to them. Well-planned, thoroughly organized, and carefully conducted tryout courses have been found to be effective. The problem of the mentally superior young person usually constitutes the selecting of that form of work activity in which he is interested, for participation in which he can receive adequate training, and in which openings will be available when he is trained. The mentally slower young person must be willing to harness his ambitions to his abilities. He needs much help in discovering a vocation that will satisfy his interests, while the demands of the job do not go beyond his ability to perform.

[1] See L. D. Crow and A. Crow, *Adolescent Development and Adjustment*, Chapter 16. McGraw-Hill Book Company, 1956.

The values of the administration of aptitude tests and interest inventories for guidance in vocational selection were discussed in Chapter 9. Unit courses also help the student to make a wise selection. Such courses as home economics and the industrial arts (for boys and girls), typewriting and stenography, business methods, law, radio broadcasting or operation, and similar vocations, not only help students to gain a broad understanding of human relations but also serve to help them discover their vocational interests and aptitudes. The practical nature of such courses, well taught by teachers who are acquainted with the latest trends in the world of work, motivates adolescents not only to elect the courses but to make an effort to master the course content. The modern tendency to make education function in real life situations is illustrated in the present attitude of students toward vocational orientation. To the extent that work and study activities can be combined, not only will study become less formal and less divorced from everyday living, but work activities will take on added dignity and richness in their performance.

We shall assume (1) that most occupational fields can use workers who range in intelligence from the superior to the slow; (2) that individual differences in interests and abilities make necessary personal guidance in vocational selection; and (3) that broad general survey courses dealing with life activities and short unit courses having specific vocational significance are desirable. From this consideration of some of the general factors associated with vocational orientation we shall pass to a brief discussion of learning in three specific vocational areas: business or commercial activities, the industrial arts, and home economics or the home arts.

Business or commercial activities. Studies dealing with degree of successful achievement in the so-called commercial subjects — typewriting, stenography, bookkeeping and accounting, and general business practice — have shown that the more intelligent the student the more likely he is to succeed in his vocational training and consequent occupational achievement. Hence the regular commercial courses are coming to be offered to high school students possessing above average intelligence. The less able pupils are afforded opportunities to prepare themselves for general office work, including filing and routine typing.

There are several reasons for this change in educational policy. The individual who expects to earn success in the business field needs to be well grounded in English usage and the elements of arithmetical computation. He should be a quick, logical, and accurate thinker and a careful and precise worker. Qualities such as these can be achieved only by the young person who has the mental ability to acquire the needed skills and attitudes. Understanding of the significance of the work must be developed and needed skills made automatic. Five purposes of business education are listed by Kilby as:

(1) To guide persons into the kind of business work which their capacities indicate they can perform effectively and which the social group needs performed. (2) To guide persons in acquiring those understandings, skills, and habits of behavior needed to perform efficiently a chosen work in the business field and to advance therein. (3) To guide persons to an understanding and appreciation of business development, of business institutions and their functions, of business ideals and business behavior, and the effect of business activities and behavior on the social organization in which they live. (4) To guide persons to an understanding of those elementary principles and practices of business that will aid them in their personal business activities. (5) To guide persons in developing and applying those attitudes of conduct, emotional responses, and personal behaviors which will aid them in becoming efficient workers and members of the special as well as social group.[2]

Typewriting. Skill in the use of the typewriter is becoming a convenience, if not a necessity, for people in all walks of life. For the person whose typewriting activities are confined to more or less personal needs, accuracy rather than speed is important. For the individual to whom typewriting is a means of earning a livelihood, both accuracy and speed are essential.

Learning to typewrite is concerned with (1) mastery of the keyboard, (2) accuracy and skill in performance, and (3) facility in the use of language, correct spelling, and acceptable format. There is at present a definite trend toward starting learners with meaningful material, such as short sentences, rather than with nonsense syllables or unconnected letters. In addition, there must be drill, of course, in hand placement, finger action, and correct striking of unidentified keys on the keyboard.

[2] From I. W. Kilby, "Factors Determining the Scope and Sequence of Major Learnings in Business Education," *California Journal of Secondary Education,* 11:365 (1936).

With this learning approach, individual results at first may be discouraging. The experienced and tactful teacher is able to help learners to persist with their practice in spite of apparent failure. Precision of movement must be emphasized and a reasonable speed maintained in spite of errors. As in the development of any other skill, learners often find that typewriting habits are being formed even while they seem to be making little or no progress. Curves of practice in typewriting show a relatively rapid spurt at first, as simple mastery is achieved, followed by a plateau indicating little if any progress. Finally, a sudden spurt gives evidence of the fact that a kind of mental and manual coordination has taken place. The learner has mastered his skill. Continued practice should result in an increase in speed and should develop in the learner a greater degree of confidence in himself.

Stenography. Mastery of stenography resembles somewhat achievement of a meaningful command of a foreign language. To become a well-qualified stenographer requires at least normal intelligence, good hearing, good eyesight, and muscular coordination. Stenographic outlines or symbols must be mastered and associated with appropriate letters, words, or phrases. Training must be continued until these associated responses become as automatic as number combinations. The stenographer needs to hear what is dictated and to transpose these auditory stimulations into symbolic forms which later can be reread accurately and correctly transcribed into typewritten form.

There should be well-spaced, brief periods of practice that constitute intelligent drill. Emphasis should be placed upon speed and accuracy as learners are asked to write material in stenographic form and then to read back from their notes. Although speed is important, the primary emphasis should be placed upon correctness of outline until performance becomes automatic.

Bookkeeping and accounting. The requirements for successful achievement in bookkeeping and accounting are (1) meticulous accuracy, (2) extreme care and neatness in handwriting and arrangement of books, and (3) mathematical precision. As learners discover that long hours may be consumed in discovering a small error that is responsible for the fact that their books fail "to balance," they are made aware of the necessity of giving careful attention to details.

Young people who enjoy working with numbers usually develop great pride of workmanship in their study of bookkeeping which causes them to be motivated toward the achievement of still greater proficiency. Success comes only to the learner who has patient regard for detail and who is willing to devote time and energy to what may seem drudgery to the less careful worker. It is most important that in his approach a teacher follow a psychologically arranged sequence so that learners are enabled to proceed, step by step, from the simple form of entry to the more complex, thus avoiding confusion on the part of the learner concerning correct arrangement of items and consequent discouragement.

Industrial arts. Preparation for industrial occupations may be said to begin on the elementary school level when learners participate in simple manipulative experiences in the industrial arts. On the lower school level the teaching of this subject is accepted as a means of motivating children to create, to investigate, and to learn to work with others in the achievement of a worth-while project. However, a certain amount of manipulatory facility and mental training results from such experiences that later may carry over to the acquiring of a definite skill.

A well-organized course in the industrial arts on either the elementary or the secondary level would be aimed at the attainment of all or most of the objectives formulated by the Committee of the American Vocational Association in 1934. These objectives follow.

Objectives of Industrial Arts Education

1. To develop in each pupil an active interest in industrial life and in the methods of production and distribution.

2. To develop in each pupil the ability to select wisely, care for, and use properly the things he buys or uses.

3. To develop in each pupil an appreciation of good workmanship and good design.

4. To develop in each pupil an attitude of pride or interest in his ability to do useful things.

5. To develop in each pupil a feeling of self-reliance and confidence in his ability to deal with people and to care for himself in an unusual or unfamiliar situation.

6. To develop in each pupil the habit of an orderly method of procedure in the performance of any task.

7. To develop in each pupil the habit of self-discipline which requires one to do a thing when it should be done, whether it is a pleasant task or not.

. 8. To develop in each pupil the habit of careful, thoughtful work without loitering or wasting time (industry).

9. To develop in each pupil an attitude of readiness to assist others when they need help and to join in group undertakings (cooperation).

10. To develop in each pupil a thoughtful attitude in the matter of making things easy and pleasant for others.

11. To develop in each pupil a knowledge and understanding of mechanical drawing, the interpretation of the conventions in drawings and working diagrams, and the ability to express his ideas by means of a drawing.

12. To develop in each pupil elementary skill in the use of the more common tools and machines in modifying and handling materials, and an understanding of some of the more common construction problems.[3]

In an increasing number of school systems industrial or mechanical training on the secondary school level (especially in the eleventh and twelfth grades) is aimed not only at a realization of the objectives of general courses in industrial arts but at attempts to help the learner to achieve occupational competence. No matter what the objectives may be, the learning should begin with the construction of easily made objects for which simple hand tools are used. Gradually, as the learner gains confidence in his own ability to perform and as he achieves greater maturity of thinking, and muscular coordination, he can be guided toward more complex production that requires the utilization of more refined instruments or of power machines, greater facility in planning, and a higher degree of craftsmanship. It may not be the responsibility of the high school to turn out a skilled workman; however, the general background of training that is received by a boy in high school enables him either to complete his training in a specialized field or to perfect his skill on the job.

Home economics and related fields. The activities included in these areas of learning are of practical value to every individual — man or woman — regardless of his actual occupational field. The selection and preparation of food, child care, nursing,

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[3] From *Standards of Attainment in Industrial Arts Teaching*, Report of the Committee of the American Vocational Association, p. 12. Washington, D. C., 1934.

home management, family budgeting, home decoration, and clothing design and production constitute essential activities in everyday living.

Apart from the personal application of training in these fields, there also are opportunities in the world of work for young people who by personal qualifications and training are fitted to render service of this kind to others. Intelligence, patience, interest in the welfare of others, and care for details are some of the qualities that are necessary for success in these activities. The achievement and preservation of good health are receiving increased attention from the public at large as well as from health specialists. Nutrition, child care, the development of good health habits, the care of the sick, and the prevention of disease are matters of serious concern to men as well as to women. Attractiveness of appearance — whether of dress or of home decoration — also is receiving increased attention. Training in the field of home economics is fast becoming an answer to a felt need.

QUESTIONS AND TOPICS FOR DISCUSSION

1. List ten friends or acquaintances who are gainfully employed. For each try to answer the following questions:
   - *a.* Is he or she contented in his work?
   - *b.* When did he make his final selection of the vocation and under what circumstances?
   - *c.* How much preparation for his present work does he have and where did he receive it?
   - *d.* Do you believe that he is in the "right" job? If not, what other type of work would you consider to be better suited for him?

2. Why have you selected teaching as your vocation? List the characteristics that you believe you should possess in order to become an efficient teacher.

3. Discuss the value to secondary school students of general survey or exploratory courses dealing with vocations.

4. Of the unit courses referred to in this chapter, name any that you have taken. Of what value have they been to you? Which others do you wish you had taken? Why?

5. List some occupations that you believe to be better suited for women than for men. Give reasons for your selections.

6. To what extent do the home and the school usually influence a young person in his choice of a vocation?

7. If you have studied typewriting, discuss some of the difficulties that you encountered during the learning process.

8. Why is continued practice so important to stenographers?
9. Defend the thesis that both boys and girls should receive some training in home economics and the industrial arts.
10. What is meant by job analysis? Of what value is it to help a young person select his vocation?
11. Do you believe that a person should be fitted to the job or the job fitted to the person? Defend your answer.

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Part VII

LIFE ADJUSTMENTS

THE ultimate value to the individual of the outcomes of his education lies in the extent to which what he has learned or is in the process of learning fits him for adequate adaptation to his own life needs and to the demands of society. He brings to his educational experiences the sum total of his abilities, interests, and attitudes. By his school and out-of-school experiences he continuously is being molded into the kind of person that he now is and that eventually he will become. All the agencies that are concerned with the development of the child or adolescent — especially the home and the school — must early become aware of those phases of the individual's behavior that represent significant factors of satisfying and productive achievement. An individual is not born adjusted or maladjusted. It is as his physical, mental, and emotional potentialities are influenced and directed by the factors of the environment in which he finds himself that adjustment or maladjustment gradually develops. In PART VII, therefore, are presented some of the factors that may predispose toward maladjustment. However, education toward wholesome adjustment is emphasized throughout the discussion.

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ADJUSTMENT OF EXCEPTIONAL INDIVIDUALS

Human traits distribute themselves among people in such way that a few individuals are found at the extremes of any distribution curve for one or another of the respective traits of the members of a community. Although most persons resemble the average of the group in many characteristics, there are those who deviate widely from the average in certain traits. These deviations create certain problems of adjustment for those individuals who may be denied participation in activities common to the majority of other persons.

EXCEPTIONAL INDIVIDUALS

General concept of atypical or exceptional. An individual may be atypical or a deviate from the generally accepted norm in any one of many ways. He may be exceptionally tall or exceptionally short; physically robust or physically weak. He may exhibit great emotional stability or tend to meet life with little or no control of his emotions. He may be outstanding in mental ability or so lacking in that ability that he is unable to assume the simple responsibilities of ordinary living. He may have specialized talents, such as superior ability in music, art, or mathematics. He may display physical defects, such as blindness, deafness, bodily deformity, or frailty.

The adjustment problems of exceptional persons are the concern of both the individuals themselves and the members of the larger, average group. Since most social groups are composed

of normal as well as abnormal individuals, an understanding of one another as *persons* helps to effect adjustments among the group members. The exceptional person should understand the nature and extent of his difference from others, know how others differ from him, appreciate the psychological and physical bases for these differences, and be given training in the kind of attitude development that will help him personally and socially. This discussion presents a brief consideration of the factors that are involved in the individual adjustment of an exceptional person so that he and his associates may be more tolerant of his problems, regardless of the kind and amount of his deviation from accepted normalcy.

Since an atypical person is faced with adjustment problems peculiar to himself in all of his group associations during his lifetime, this chapter is devoted to a consideration of his problems in the home, the school his occupational life, and his general social relationships.

Interpretation of the atypical or exceptional in specific traits. Variation as well as similarity is characteristic of human nature. The fact that individuals differ from one another physically, mentally, and emotionally is an accepted truth. The term *atypical* or *exceptional* is applied to a trait or to a person possessing the trait if the extent of deviation from normal possession of the trait is so great that because of it the individual warrants or receives special attention from his fellows and his behavior responses and activities are thereby affected. Below are explained briefly the generally accepted kinds of atypical or exceptional persons.

The gifted. Among the gifted there may be found two types of superior persons: (1) those whose intelligence quotients are above 130 as measured by reliable standardized intelligence tests — the intellectually gifted; and (2) those who have special talents in one or more limited fields, such as art, dramatics, music, or mathematics — the talented.

The mentally retarded. According to Terman and the White House Conference,[1] an individual whose intelligence quotient is below 70 falls in the atypical group known as the mentally retarded, the dull, or the low I.Q.

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[1] White House Conference, *Special Education: The Handicapped and the Gifted.* The Century Company, New York, 1931.

The cripple. In this discussion the crippled person is defined as the individual who is maimed in body in such way that he lacks, either completely or partially, the power of manipulation or locomotion.

The blind and near blind. The blind and near blind include those persons whose vision is less than 20/200 according to the Snellen Chart.

The deaf and hard of hearing. Technically, the term "deaf" is applied only to a person who has never had hearing, who lost his hearing before he achieved speech, or who lost his hearing so soon after learning to speak that his power of speech also has been lost. An individual who loses his hearing after he has acquired speech is classified as "hard of hearing." The term "deaf" has been applied rather loosely to anyone who suffers from loss of hearing, regardless of the extent of the loss.

Speech defects. Speech defect refers to the kind of speech abnormality that usually requires the help of an expert if it is to be overcome. Included among speech defects are any one of the following: inaudible or labored speech, unintelligible speech, and speech that is vocally unpleasant.

The delicate person. In this group are included all persons whose health condition is such that they need to exercise care of their health even though they are not suffering from a specific disease or bedridden: those who are anemic, low in vitality, cardiac, or tubercular; or those who need additional care in order to acquire the physical vigor demanded of them in their daily activities.

HOME ADJUSTMENT OF EXCEPTIONAL INDIVIDUALS

The gifted. Too often a father and mother who have discovered that their child has ability far beyond that of other children of his age emphasize this fact to the detriment of the child. When friends visit the home, the child is called upon to exhibit his special but still untrained talent. The attitude of the child is certain to be affected by this experience. After a time he no longer may desire to be the family entertainer. As a result, he may develop an attitude of resentment that is intensified if his parents insist upon his "showing off." Evidence of superiority in a child should be recognized but not overemphasized. Creativeness cannot be expected to flow daily in even currents.

The gifted early show signs of leadership. They understand relationships, and expect other children to be interested in the games that they want to play according to the rules that they establish. Their aggressiveness sometimes is attributed to lack of training. In many instances, however, this attitude can be traced to parental overencouragement of self-expression. Consequently, the child may have many adjustment handicaps to overcome when he enters school. His parents have given more attention to the cleverness of their bright youngster than to the development of social attitudes commensurate with his ability.

The problems of the gifted child that arise in the home multiply as he passes through the elementary grades into the high school. Since he is able to progress through school more rapidly than pupils of average ability, he may begin early to demand privileges that the parents consider too advanced for his age. As an adolescent in high school, he may wish to engage in the social activities of his older classmates.

In spite of the fact that they have encouraged him in his rapid school progress, his parents realize that he is just a child. They believe that it is wise to deny to him the liberties that his more mature classmates are enjoying. The parents' inability to explain to him satisfactorily the reasons for their attitude often causes conflict in the home and great unhappiness for the child.

Moreover, if the child is permitted by his parents to participate in the desired social activities, he discovers that he must be one of the group, live with the group, and develop interests akin to those of the group, in order to realize the joy from that experience that he will find satisfying. An intellectually superior but emotionally and socially immature young person may have difficulty in making a satisfactory adjustment to the attitude and behavior of his chronologically older and emotionally more mature associates.

The gifted who attend college usually are graduated at an early age, to the great satisfaction of their parents. This success helps in the home adjustment. However, unless the young adult can secure a satisfactory vocational outlet for the utilization of his talents and of his extended training, there may result a series of conflicts that will center around the home. The gifted who are able to make desirable occupational adjustments and who are given adequate concepts of home relationships develop

desirable attitudes, and eventually achieve vocational success and become well-adjusted husbands and wives.

The specially talented young person presents a somewhat different problem. In their relations with him, other persons may tend to emphasize his special aptitude to the neglect of other desirable qualities that he may possess. Hence he may develop the attitude that he is good for one thing only. He may be encouraged to feel that he is different from other people, or a little "queer."

As a result of his first success in music, art, or any other special field of talent, this young person develops a keen desire to gain further success in that field, and other adjustment problems are shunted aside. The school gets him too late to overcome the handicap that originated in the home. His parents want this special success to continue. Consequently, the individual creates many adjustment problems for himself as it becomes increasingly difficult for him to live with his family. Later, when he has a home of his own, he may allow similar conflicts to disrupt his life largely because he has had poor training in adjusting to normal situations.

The mentally retarded. No parent likes to believe that his child is mentally dull. Hence parents need help in developing an interest in the significance of their children's degree of mental ability. When a child's intelligence is found to be average, above average, or below average, according to the results of the administration of a reliable test of mental ability, parents should be stimulated to do for the child whatever is best for him. The child suffers most if parents insist that he do things in which he has little chance of success. The dull child is an *individual* and may need more help than brighter children.

The adjustment problems of individuals whose intelligence quotients fall below 70 are vastly different from those who score above 130. For the retarded, patience and painstaking efforts are fruitful in character development. Mentally retarded people have little chance for leadership; they seek the friendship of others more than they are sought. The home cannot exercise enough supervision over their behavior to make of them desirable and efficient citizens.

Extremely subnormal individuals are best cared for and directed toward adequate living in segregated institutions. If

their mentality is sufficient for them to adjust to a simple form of social living, it might be desirable for them to be sterilized in order to prevent the procreation of their kind. California has developed a sterilization program, and most states permit its practice.

The cripple. The individual who is crippled from birth receives special care at home, and learns early to lean upon others for the satisfaction of his needs. During the trying years of infancy and childhood, it is possible for his parents to help him to develop a proper attitude toward his infirmity. However, he usually becomes the spoiled child. Too often, this spoiling continues in his home throughout his life. Sensible parents can train the physically handicapped child to adjust to his handicap and to develop a wholesome attitude toward himself and toward those about him. His crippled condition-does not entitle him to an undue amount of attention, nor should his deformity be the center of discussion. Such treatment is likely to develop in him an attitude of egoism rather than interest in the welfare of his family and of persons outside the home.

Moreover, parents must keep in mind that the cripple is human; that he has hopes and ambitions, as do those who are more fortunate than he; and that he may have average or superior mental ability. He usually is ready and willing to do his utmost to succeed in more things than he is given a chance to attempt. Parents need training so that they may understand better the adjustment problems of the cripple in the home.

The crippled child's restlessness increases as he matures mentally, physically, and physiologically. His drives are powerful during adolescence. In many cases it is then that his schooling is terminated and he is confined more and more to the home. He develops a negativistic attitude because he is denied normal activities. He is indeed fortunate if he receives the kind of training that will fit him as an adult for a form of work in which he can achieve vocational success. His consideration for others is increased thereby and he is enabled to develop attitudes that will make it possible for him to participate, as an adult, in successful home and social living.

The blind and the near blind. The infant who is blind or near blind cannot understand his limitations of experience. With increasing maturity there comes to the blind person an

awareness of his limitation, and a consequent development of attitudes that are easy to understand but difficult to change. A retreat into himself may be allowed by his parents either because they have insufficient time to give to his development or because they know too little concerning proper methods of training. He is shy; he wants to play alone; and, if companions are available, he is satisfied to limit his friendship to one or two understanding individuals. Usually his most desired companion is his mother.

His home adjustments become more difficult during his school life. He may come to believe that he is numbered among the unwanted. His parents then may realize that they have not given him sufficient opportunity for social adjustment. He becomes impatient with his parents. This impatience usually reacts upon himself toward the further aggravation of the already existent problem.

As adults, the visually handicapped may make a desperate effort to help themselves. Fortunately, in our present society, many of them are able to make definite adjustments to the group and to the job. Consequently, these individuals often are able to achieve home, social, and occupational adjustment comparable to that of persons who have normal vision.

The deaf and the hard of hearing. The deaf child usually receives little satisfactory stimulation in the home, and therefore may begin his school life without the use of language. Consequently, his adjustment is difficult because of parental ignorance of proper techniques of training. When training is given to develop language skill, a deaf person can make some progress and should receive encouragement from those who have normal hearing ability. It is the school's responsibility to help the deaf to develop techniques of communication with normal people and with those afflicted as he is. Helen Keller, although an unusual woman, is an outstanding example of what can be done with a person who is both deaf and blind.

The hard of hearing have problems that are somewhat different from the problems of the completely deaf but nevertheless significant to themselves and to those with whom they come in contact. When parents discover that their child does not hear well, they should provide for a complete diagnosis and should then begin at once to follow therapeutic measures that will enable their child to carry on communication with others.

Complete or partial deafness tends to develop in persons so afflicted an attitude of suspicion that can affect seriously their relationship with their associates.

The individual with defective speech. There are many forms of speech defects, such as unattractive speech habits resulting from imitation of inadequate speech, various forms of lisps caused by defective dentation or improper use of the tongue, stammering or stuttering, and the like. The kind and nature of the defect must be measured in terms of the total effect upon the child. The cause of most functional speech defects can be traced directly to home influence. Careless, inaccurate, or slovenly speech is usually the result of the child's imitation of the speech that he hears during his early years.

It is difficult for a young child to manipulate all sound combinations. His peculiar trial-and-error attempts often are considered "cute" by his elders. Instead of the encouragement of improved pronunciation, he receives approval for his mispronunciation, with the result that the latter becomes a part of his speech pattern and can be changed only through expert training. If a child receives help rather than flattery or ridicule for his odd speech, he can avoid the intensification of the defect and achieve the self-confidence that is necessary for the development of correct speech. The parent who ridiculed the child who said "weet tatoes" for sweet potatoes only to have the child say in anger, "I didn't say 'weet *tatoes*' I said '*weet* tatoes'!" was not helping the speech but was creating for the child an adjustment problem that might have become as serious as the speech defect.

Speech defects caused by improper use of the tongue, irregular or badly formed teeth, or throat or nose difficulties can be prevented or remedied if parents provide for periodic medical and dental checkups to discover malformation or other factors that need attention. Unfortunately, the members of a family may be more interested in *what* the child says as he develops increasing power of ideation than they are in *how* he says it.

Because of the intimacy of daily associations, the members of a family can comprehend one another's meaning easily, no matter how inadequate the method of communication may be. Hence, they are not critical of defective speech and the child is not prepared for the task of conveying his ideas clearly, distinctly, and correctly to persons outside the home. The problem

increases as the individual matures and enlarges his social group. His speech inadequacy develops a fear of social situations. The consequent maladjusting effect upon his personality is further intensified by the fact that his attempts at speech improvement may be hampered by his continued imitation of the subnormal speech standards of his family.

Although the causes of stammering and stuttering have not yet been fully discovered, these speech difficulties seem to accompany disturbed emotional states. Hence, the home can do much to help the child so afflicted to overcome his difficulty, or the home can be the direct source of the development of the speech defect. Over-attention to or ridicule of early speech errors may so disturb the child's nervous system that he becomes unable to make certain sounds correctly, or to articulate at all. Too much over-excitement or stimulation of the young child may result in a nervous tension and a consequent speech defect. If a child becomes conscious of a speech difficulty, a resulting uncontrollable fear of speaking leads to a further intensification of the speech defect. Acute and persistent stuttering has its basis in such speech fears.

Sometimes parents and other relatives, recognizing the stammering or stuttering of the child, attempt to help him, each according to his own method. The child is confused by these differing forms of advice and his emotional disturbance increases. Thus, instead of relieving the emotional strain, the family intensifies it.

A child should be stimulated in his home by good speech models. The family should not resort to "baby" talk in addressing a child nor should they encourage him to use it. Physical defects should be attended to, and the emotional atmosphere in which the child grows should be quiet and well-ordered so that emotional shocks to his nervous system may be avoided. Any attempts on the part of the family toward redirecting a child's faulty speech should be objective, consistent, and based on knowledge of the probable cause of the difficulty and of scientific techniques for improvement.

The delicate individual. The very helplessness of the delicate infant or child is the basis of any spoiling. His continuing delicacy gives added reason for his continued spoiling by those who try to care for his needs. The child learns to gain attention, and

develops this attitude to a fine art as he proceeds through life. Before his school experiences begin, parents should attempt to help this child to realize that he is deserving of consideration and care but that other persons also deserve consideration of their wants, interests, desires, and problems. If parents are able to instill in the thinking of the delicate child this consideration of others as well as of himself, the cooperation between the school and the home will be made easier, and those personal attitudes that should be established will have a greater chance for development.

The delicate adult should not be pampered, but he should receive the consideration that his condition warrants. Moreover, he should be given opportunities to accomplish tasks that are within the limits of his strength. He should be encouraged to feel that he can achieve success in appropriate activities.

Too often, the life of an entire family revolves around the whims and the demands of a delicate member, and the sacrifices required in his behalf may lead to a general attitude of disharmony. All members of a family are entitled to a place in the home and all should be helped to gain that place with accompanying satisfaction to themselves.

SCHOOL ADJUSTMENT OF EXCEPTIONAL INDIVIDUALS

The gifted. In general, gifted persons are superior in character, personality traits, emotional stability, and school adjustment. Nevertheless, these individuals have many personal and social adjustment problems. Under present school procedure, the gifted child who works to capacity so far excels his fellow classmates that the latter may learn to dislike him. If he asks questions in class, he is thought to be annoying the teacher. If he is not permitted to answer all the questions, he becomes bored and his interest and energies may turn to undesirable activities. If he purposely fails in class in order to win the friendship of his classmates, if he tries not to be called a bookworm, or if he does not want to be called teacher's pet, he must be careful that his conduct is not misunderstood. When the bright child reveals social qualities, other pupils tend to rally around him and make him their leader. This treatment is appreciated by the bright pupil since he usually is gregarious and socially-minded.

Capacity for adjustment is present in the gifted. By adapting school offerings and techniques of instruction to their needs, individual and social adaptations can be facilitated.

Educational leaders are gaining an appreciation of the need of the gifted for social experiences in many areas of 'earning. In order to bring about a better personality development, they are beginning to emphasize enrichment rather than acceleration of curriculum. This makes possible the pursuit of ideas so far as continuance of interest will carry the bright student. At the same time he is enabled to gain an appreciation of those other essential values of life that often are lost through rapid promotion.

As a result of her experimental work with a gifted group in the Speyer School in New York City, Leta S. Hollingworth's [2] conclusions concerning their education are: "To take their unique places in civilized society, it would seem, therefore, that the intellectually gifted need especially to know the evolution of culture as it has been. And since at eight or nine years of age, they are not as yet ready for specialization, what they need to know is the evolution of culture as it has affected *common things*." Among the common things are included food, shelter, transportation, and the like. Through these media, thinking can be stimulated and intellectual curiosity can be satisfied.

The gifted individual should be made aware of his potentiality for study, and should learn early that his responsibility for success is greater because of his superior ability. However, we sometimes err in thinking that a young person who has demonstrated superior academic achievement also has made certain individual and social adjustments with equal success. The most that his superior intelligence can do for him is to help him to acquire these other adjustments with ease and speed. He must undergo experiences similar to those of the normal individual if he is to make the changes required of him for becoming a better person in his ever-changing environment.

Care should be exercised lest the mentally superior person is given the kind of education that may develop in him an overappreciation of himself and of his own abilities. When success comes with little effort in competition with persons who possess

[2] L. S. Hollingworth, "An Enriched Curriculum for Rapid Learners at P. S. 500," *Teachers College Record*, 39:299 (January, 1938).

less mental ability, an egotistical attitude is hard to avoid. To push the gifted individual ahead in school simply because he can pass certain required examinations may create for him many maladjustments. His social and physical development requires the same careful consideration and planning as does his mental development. "Honors schools" and honors classes have the advantage of allowing a young person to develop mentally in a homogeneous group. However, great care must be exercised in the selection of candidates for such groups. A persevering and industrious student of less ability who has achieved high marks in a normal class should not be included among the natively endowed, thus exposing this child to a situation in which relative failure and consequent discouragement are imminent. The superior group must not be separated entirely from participation in the activities of normal students. Since we look to the bright for leadership, they must learn to understand the average group and to be appreciated by it. Intellectual snobbery may result in social isolation.

In general, the gifted child should be permitted to work to the limit of his ability. So that he does not develop habits of carelessness and indifference, he should receive his instruction in a homogeneous group. He should be allowed to proceed normally through the grades with an enriched curriculum. He should be provided with social experiences so as to avoid social maladjustments. He should be expected to exert himself if he desires *to rate* with the group. He should be given opportunity and training for leadership in specific situations. Finally, he should be helped to utilize to their fullest extent all the opportunities provided for the development of his superior ability.

The extent to which a specially talented child should be subjected to specific requirements of a general course of study is a problem that has not yet been solved. The child who is exceptionally talented in art may find it almost impossible to meet a high standard of achievement in English, history, science, or other academic subject. Since high school and college graduation demands the fulfillment of such requirements, many exceptionally talented individuals become discouraged. Society appears to want the specialist but also demands a general cultural background. Certain curricular adjustments need to be made for these individuals if they are to be given an oppor-

tunity to pursue their special interest and at the same time fulfill cultural requirements without too much danger of personality maladjustment.

The mentally retarded. Since their experience in school tends to be that of failure, mentally retarded pupils are in danger of developing emotional maladjustment. The school program too often has been geared to the average pupil. The bright student has been able to slide along, but the retarded child has been forced to face failure and thus experience feelings of frustration. In a school situation of this kind, the slow child learns to feel that he is and will be a failure in life; his ambition is ignored, stunted, or destroyed, and he is led early to believe that he can never succeed.

Some of these dull children can succeed in school and in life. If their interest is stimulated and if they are given a chance to achieve even a little success, they can be led to master many of the simple abstractions that they seem unable to comprehend. The teaching vocabulary must be simple, the reading material must be written around life interests, and the general teaching and learning pace must be slowed down. They then can profit greatly and, within their mental limitations, can become successful learners.

Part of the failure of the mentally retarded has been caused by educational leaders who have placed these children in situations in which they cannot succeed and then have done nothing to help them in their adjustment. These children need all the psychological aid that can be given them.

The writers once visited a "low I.Q." class that was using a classroom regularly labeled 6B. Although the academic level of the members of this group was not that of the sixth grade, their age warranted this designation. On this particular day, the designation had been changed (as a prank) to 4B. The class protested the apparent demotion. Since they had taken great pride in their 6B designation, they resented the fact that they would lose prestige with their schoolmates as a result of this change of designation.

The establishment of habits of work based upon successful achievement is the right of this group. They should expect something from school. From a vocational point of view, they deserve training that will develop attitudes of successful achievement.

Through the industrial training that many of them now are receiving, they are being prepared to take their places in industry and to achieve a fairly satisfactory adult pattern of life.

Although children with intelligence quotients between 55 and 70 can respond to modified techniques of school training, those whose retardation places them in the group having intelligence quotients below 55 respond best to the routine and carefully controlled manual and personal habit development that can be provided for them only in well-organized and intelligently staffed institutions. The extremely low group is able to respond only to the stimulation of its basic survival needs.

Parental attitudes toward the mental handicap of their child exercise a potent influence upon his emotional behavior. Some mothers continually prod their children from birth onward; too many parents appear unable to accept the fact that during his earlier years a child may not be successful in school work nor display alertness in his home or other relationships. The parents often believe the retardation to be caused by slow development that eventually will correct itself. After the child reaches his teen years his parents no longer can blame the developmental process for the retarded behavior. Then, regardless of the parents' expressions of disappointment, the child becomes the victim of these attitudes toward him.[3]

The blind. The blind have many adjustment problems. Other children often are too busy in their own play to give time to those who require individual attention in order to participate in the activities of the group. The blind feel that they are nuisances, especially to those of their own age. As a result they early develop withdrawal tendencies. Unless the teacher is particularly skillful and patient in redirecting their attention and in developing a new sense of values, blind pupils are certain to develop maladjustments that will interfere with their later happiness. Helen Keller is the idol of this group. The influence of her work, her progress in spite of many handicaps, and her fine attitude toward life have done much to give encouragement to other handicapped persons.

Interest in the education of this group has led to the inclusion in their program of training of techniques aimed at the develop-

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[3] See C. P. Ingram, *Educating the Slow-Learning Child*, Second Edition. Copyright, 1953, by The Ronald Press Company.

ment of social, ethical, and emotional values. It is easy to teach the blind to cane chairs, to weave rugs, and to make baskets. It is more important that they are helped to develop zest and happiness. Most states have established schools for the blind or near blind in which personal as well as vocational adjustment is the aim of the educational program.

Many experiences are provided in these state schools. The child not only enjoys an enriched program of study but he also is given music in all of its forms. Training for the vocation of piano tuning is encouraged, for those who have the interest and talent. Sewing and needle arts are pursued and a sense of accomplishment is developed through them. Industrial and manual work is taught in order to help the blind become self-supporting and to develop the satisfaction which results from approved achievement. Those who possess superior intelligence are guided toward teaching of the blind as a career, or other fields of work such as stenotyping.

The near blind. These children are placed in sight-saving or sight-conservation classes. The education of this group is not so complex as that of the totally blind, yet the adjustment problems are equally great. The near blind struggle more ardently to compete with the normal group. They want to follow the pursuits of the latter. In so doing, they may endanger their own safety since they tend not to report the extent of their seeing difficulty until they have suffered from an unfortunate experience.

This group needs adjustment help similar to that given to the blind. They must be helped to understand that the attitudes of others will be different toward them from what it is toward *seeing* children. Children are active. It is difficult to direct the activity of those who have interests, desires, and physical ability *to do* but who are limited by defective vision. To attempt to play baseball is to invite disaster. It is the responsibility of the teacher, the parent, or the leader to organize games that are interesting to the child and within his vision possibilities.

These children should be trained in the care of their eyes. Those who can profit by proper eye exercises should be helped to practice them. The plan of treatment outlined for each child should be known to the teacher and to the parents, and they should cooperate in encouraging the child to follow whatever program of eye care and exercise has been recommended by the

specialist. We must not allow teachers and others to take a defeatist attitude toward weak eyes. The eyesight of many can be improved. This is more than likely to happen if the will to do so is stimulated.

Not only should children who have eye difficulties be informed concerning the causes of and remedies for poor eyesight and blindness, but all children should be helped to know about the importance of and the proper protection of their own eyes. Prevention of blindness or near blindness is a social responsibility. Preventive measures that should be known and followed include the education of all children, the education of parents, regular eye examinations of the preschool child and of the school child, specially trained teachers, improved school lighting, and carefully printed textbooks.

The deaf. The completely deaf child, when he enters school, faces the problem of developing a language through the use of senses other than that of hearing. Since he lacks the ability to imitate the voices of others, his imitation is limited to an observation of the facial movements of a speaker or to the study, through eyes and touch, of the movements of his own throat, lips, and tongue in attempted speech. The struggle to overcome these handicaps tries the teacher's patience as well as that of the learner. Again this group has the glorious example of Helen Keller to spur them on. Through study of her experiences they can be taught that the struggle is difficult but that mastery is possible for those who persist.

The opportunities of the deaf person should not be limited unduly. Equalization of educational opportunity should be respected, and his handicap should determine the limits of his training. That deaf children be educated so that they can communicate with hearing people is advocated by those educators who desire classes provided for them in regular schools. Social usefulness is enhanced through the development of proficiency in intercommunication. As the barriers are broken down between the normal and the deaf through their learning together, they may be enabled to build attitudes that will prevent the deaf from becoming a group apart. Those who can hear must understand the capacities and limitations of deaf children and must be trained to react to the handicapped as they do to hearing children.

The specialized teacher can do much for the social development of the deaf. The social effectiveness of deaf persons depends upon their ability to make social contacts with others of their own group and with persons in other groups. The struggle of the deaf to excel may leave in its wake, because of delayed success, attitude scars difficult to erase. The teacher, at every step in the training, must be alert to provide opportunities for their emotional adjustment.

The hard of hearing. The problems of the hard of hearing are somewhat different from the problems of the completely deaf, but equally significant. Many children are not willing to admit that they cannot hear. They much prefer to create the impression that they are unable to master the work or that they are dull. Elders are at fault if they do not help the hard of hearing to realize that they cannot learn well unless they receive full and complete impressions, since partial knowledge results from improper sense stimulation.

Many of this group encourage in others an attitude of pity toward them. This is undesirable. The handicapped individuals should be called upon to make adjustments without receiving undue consideration because of their handicap. Since they do not want to be considered a separate group, they need to be trained in the development of desirable social attitudes. This can be accomplished if teachers, parents, and other children work together in helping the hard of hearing in their mastery of lip reading and in their speech education.

Defective speech. There are serious educational problems connected with the personality adjustment of the million or more school children in America whose speech defects are sufficiently serious to require remedial treatment. If the speech defect destroys the child's confidence, he can neither develop into a self-supporting member of society nor become a contributor to his group. Since speech is the medium of contact, it is one of the most important factors of personality adjustment.

The problem of speech handicap is made more serious by its psychological resultants. A child, called upon in school to count, said, "One, two, three, four, five, six, —, eight, nine, ten." The teacher asked him to try again and to say "seven" the next time. This he did but substituted "wan-wah" for the number which he could not say. This response was made the point of an amus-

ing story by the teacher. Another teacher heard a child say "chenty" for "twenty" and related the incident to other teachers in the child's hearing, to his great humiliation. Even adults who speak well are guilty occasionally of similar speech slips and need courage to throw off the psychological effects of the mistake if it is unduly stressed by their associates. Children are extremely sensitive to incidents of this nature.

If speech adjustments are to be made, the child needs to be individually motivated. Routine drill does little to correct the defect unless there is awakened a desire to improve the speech difficulty. The child should be educated in regular classes and should gain an appreciation of the fact that the difficulty can be corrected. In addition to his regular work, special exercises should be given to him by a speech specialist. However, the speech handicap should not be over-emphasized. The child should be led, through careful guidance, to correct his difficulty and to continue as a functional unit of his class. All conflicts, particularly the emotional reactions of fear and worry, should be eliminated to as great a degree as possible. This is especially important in cases of stammering and stuttering.

In one high school, a group of students whose speech defects appear to be rooted in emotional maladjustment attend all regular recitations; but, for one period each day, they meet as a club for a program of special activities under the direction of a trained speech specialist, a health education teacher, a music teacher, and a psychologist. These instructors meet with the group on different days, but cooperate in the development of a program of varied social activities, including dramatics, singing, and dancing. The psychologist, through group and individual guidance, studies the students individually in order to determine the possible causes of their difficulties and to encourage self-confidence. Cooperation, relaxation, and friendliness are stressed. The majority of these students are mentally superior and are able to take to their regular classes the relaxed attitudes developed in their special class. During the three years of the experiment, some of the students have been graduated from the school and have adjusted to normal family, vocational, and social relationships.

The problem is complicated by differing standards in speech. The public is becoming increasingly speech conscious, partly as

a result of the increased speech training given on all school levels. Care of speech in all classes, and speech clinics under the direction of specially trained speech experts are effecting an improvement in general American speech.

Since it is hygienically unsound to develop in an individual over-consciousness of a possible or an actual defect, the present educational emphasis upon correct speech habits may in itself be the cause of speech difficulty. The trained specialists who realize the dangers as well as the therapeutic values of their work are careful to avoid the development of any undue tensions. Their whole program is aimed at sympathetic direction and exercise in motivated activities.

The delicate individual. The school problems of the delicate child have not received sufficient attention because his handicap is less obvious than are some others, and because he tries to compete with physically able children. Many delicate children get a poor start in their school life. They are forced to miss stimulating school experiences as a result of irregular attendance. They often are passive observers of the more strenuous activities of their schoolmates. They struggle to fight off disease and illness, and they do not have enough energy to do the work in which they otherwise would be interested.

The physical, mental, and personality development of many of these children is arrested through educational lacks that can be provided as better planning and consideration are given to their intellectual needs. Children cannot be active if they are undernourished, nor can they fight off disease if their vitality is below normal. Food values should be known to parents. Food, as well as medical examinations and treatment, should be made available by the school or other social agencies to those in need. Parents should be informed concerning the causes and treatment of the common ailments or diseases of children so that the latter may not carry with them through life the undesirable effects of such experiences.

Food, warmth, activity, rest, medical care, adjustable equipment, home cooperation, and an intelligent attitude toward hygienic living are the basic factors of the adjustment of a delicate child as he lives and grows in his home and school environment. He must be encouraged to feel that he is an individual and that his success is as important as the success of any other

child. He should be encouraged to participate in well-graded activity so that he develops in strength and health but does not overexert himself to the point of injury.

The cripple. That these children should be educated is an accepted fact, but no general agreement has been reached concerning the most desirable methods and organization of their schooling. In some cities these children are segregated in specially constructed and equipped buildings, necessitating long bus rides to and from school. The effects of the difficult traveling may offset the value of the special school advantages. In other localities, special rooms are equipped to provide for the training, feeding, and rest needs of these children. Unless elevators are available, these rooms are located on the ground floor. In many communities, high school students attend regular classes in buildings equipped with elevators, but are allowed special privileges in such matters as leaving their classes early enough to avoid traveling through crowded corridors. For those cripples who are bedridden, there is provided in the home or in hospitals schooling which emphasizes desirable adjustment to their handicapped condition.

Public-spirited individuals and philanthropic organizations are giving noteworthy attention to specific forms of physical handicap. This public interest was given definite impetus through the leadership of the late President Roosevelt, as he undertook to arouse public sentiment toward the raising of funds for the care and education of the victims of infantile paralysis.

Already more than twenty-five states have provided, through legislation, sound educational programs for the cripple. Elise H. Martens,[4] Senior Specialist in the Education of Exceptional Children, U. S. Office of Education, reports that in 1945 significant strides were made for "the realization of a complete program of special educational services in this field." This program not only includes increasing recognition of the educational needs of the handicapped but also emphasizes (1) an early beginning of this education; (2) a need for qualified teaching personnel; and (3) provision for counseling and adjustment service.

The physically handicapped are entitled to provision for their needs in terms of schools, equipment, and transportation that

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[4] E. H. Martens, "State Legislation for Exceptional Children," *School Life*, Official Journal of U. S. Office of Education, 28:no. 2:3–6 (November, 1945).

will enable them to develop mentally, to adjust their attitudes in terms of their handicap, and to attain whatever is possible for them in the way of vocational competence. It is important that their training should be aimed at self-help, initiative, and self-reliance.

SOCIAL ADJUSTMENT OF EXCEPTIONAL PERSONS

The exceptional person in his group. The person who, through no fault of his own, differs in one way or another from the general group pattern faces the problem of a social adjustment that is much more difficult than is the adjustment of an acceptedly normal individual. Because of his abnormality, the exceptional person arouses in his fellows certain attitudes which affect social interrelations. This situation holds for the exceptional child as well as for the exceptional adolescent and adult. It is essential for the social adjustment of this individual, therefore, that he be led early to recognize the form that the general social attitude toward his peculiar deviation may take, and that he be prepared to meet the consequent effects of this attitude upon himself and upon his attitude toward others.

Social adjustment of the mentally superior. Mental superiority implies that the unusually bright person possesses a mental maturity beyond that of his normal age group. Consequently, he is able to evaluate situations and activities in a more mature fashion than is possible for others of his age group. The superior person often finds the behavior of his group boring, "childish," or inconsequential. Any attempt on his part to criticize the behavior of others on this basis is certain to be resented, and he finds himself the object of disapproval. If his contempt for accepted activities causes him to suggest changes in them, he may be ostracized by the group as too "bossy." In any event, the social life of the superior person is likely to be a lonely life or, at best, one limited to companionship with a few others of his own kind. The bright child, unless he is willing to or can conform to the accepted forms of child play, finds himself without playmates of his own age. He is then limited in his search for companionship to the flattering attention of adults who, while they may welcome him because he is so unusually sensible for his age, cannot give him the social experiences which he needs and craves.

Because of his association with his elders, the bright young person may develop adult attitudes and fail to pass through the normal stage of adolescent enthusiasms and interests. He cannot understand the interest of his fellow adolescents in trivial matters and he cannot thrill with them to the obvious. There is no place for him in normal adolescent activities. Unless he is willing to be one of them, understanding them and understood by them, they will not accept his leadership. Hence, the superior adolescent may be forced to turn for companionship to books, older persons, or a small group of his own age and mental level.

His early experiences may cause the exceptional adult to feel a personal responsibility for his social adjustments, and he may become shy and reticent in his dealings with other adults. His superiority in his adult accomplishments may widen the gap between his fellows and himself to such an extent that he lives a lonely and perhaps bitter life. His very diffidence may cause him to assume an attitude of social superiority that may stimulate extreme resentment and dislike on the part of the other members of his group.

There are many well-adjusted superior persons. Their satisfactory adjustment is the result of a carefully planned program (begun for them early in life) of social cooperation that has led the superior person to appreciate the desirable qualities of other persons with their consequent acceptance of his superior abilities Such a person early becomes a respected and beloved leader of his group.

The retarded person in his group. Different in form, but similar in the psychological principles involved, are the social adjustments of an individual who is well below the average of his group in mental alertness. As a child, he is slow to grasp the rules of the game and this causes his playmates to lose patience with him. They accuse him of wanting to spoil the fun. Because of his "dumbness" he is thrown into the company of younger children who are his mental equals but his physical inferiors. Among them he achieves a certain amount of undesirable leadership, but they may resent his superior physical prowess and his attempted domination of them. Unlike the superior child, he is unable to win the attention of adults and may be forced into a kind of bewildered isolation, since he cannot understand why no one wants to associate with him.

As this child develops into adolescence and adulthood, his situation does not improve very much even though his mental status permits him to remain a member of the general social group. Although he may be tolerated, he often finds himself the victim of practical jokes. He is often no happier in social groups of his own mental level, since the other members of the group, like himself, lack the ability to plan social activities that are satisfying. Too often the activities of this group center around sexually-stimulated behavior.

This type of exceptional person must learn to contribute service in projects inaugurated by his more able associates. Many members of the retarded group have earned the respect, admiration, and friendship of society by their unfailing good nature, their willingness to cooperate to the extent of their abilities in social activities, and their successful accomplishment of more or less routine chores.

Social adjustment of the cripple. By his handicap this individual is physically barred from many social activities. He must be trained to excel in forms of activity that are possible for him so that he may win social approval through them. He also must develop as much self-care and self-service as he can attain, so that his associates do not consider his presence among them unduly burdensome.

Crippled persons usually are very sensitive about this matter of caring for their own needs. Unless they were badly spoiled through excessive help during their childhood, they resent the kindly but often awkward and futile attempts of others to give them assistance which they may not need. They also resent badly expressed pity or sympathy, as this sets barriers between them and normal social relations. The crippled need to understand that undue attention, or glances directed toward them, usually do not emanate from any feeling of superiority but are, in general, kindly and impersonal.

Many crippled persons are happy and useful, and respond to the kindly attentions of their associates in a spirit of cheerfulness and willingness to take their share in the social activities of the group. Among these cripples can be found examples of unusual conversational ability and wit.

Social adjustment of the blind and the deaf. Blind people tend to be more equable and better natured than deaf people.

The blind's sphere of experience is limited but so also is their possibility of recognizing social disapproval. Although the blind show resentment of audible comments concerning their blindness, most normally sighted persons are able to inhibit the vocal expression of their attitude toward them. Hence, the latter are not always conscious of social disapproval, pity, or attempts to help them. The deaf person, on the contrary, cannot hear what is being said but he is able to observe actions, facial expressions, and glances directed toward him or others. Because of his own recognition of his social limitations, he tends to misinterpret that which he cannot thoroughly understand and becomes resentful of real or imagined criticisms.

Normal social adjustment is extremely difficult for the blind or the deaf. They must be helped to create a world of their own that will include as many social experiences with their fellows as are practicable and that will fulfill to some extent their yearning for social activities. These individuals crave social experience but they also build up a defense against the development of friendships. They believe that they are imposing upon others and that, in their helpless state, they should inhibit their social drives. Consequently, they prefer a few friends and like to select those who, they feel, are not giving up anything just for them. A blind college student on one occasion stated that he had only two friends and that he did not want any more. This was discovered to be a defense attitude against the fact that many students tended to avoid him.

VOCATIONAL ADJUSTMENT

Seriousness of the problem. Exceptional persons feel that vocational limits have been set for them, and that, except for the mentally superior, such occupational opportunities that do not represent real social service may be artificially created by a sympathetic society in order to meet their needs. This attitude on their part is not conducive to a growing personality. They should be encouraged to recognize their personal value to the group.

The gifted are fortunate since they usually are in a position to choose their work. The professions are looking for men of ability; the arts encourage men of talent; and industry needs men of creative and promotional leadership. Hence an outlet is offered for their energies, and their personality is given an opportunity

to expand through the efforts which they expend in the solution of challenging economic and social problems.

However, the vocational adjustments that are faced by the mentally retarded, the crippled, the blind, the deaf, or the physically weak are often most discouraging. Fortunately, many business and industrial personnel departments are now able to help in the placement of individuals who are mentally or physically equipped to participate only in limited forms or kinds of work. The machine age has done much for the blind and the deaf by making it possible for them as well as for the delicate to do work that otherwise would be impossible or too exhaustive for them.

Certain companies are noted for their attention to the vocational needs of the handicapped. The Goodyear Tire and Rubber Company in Akron for many years has made it a practice to employ deaf and dumb people. Their example has been followed by many other large companies, notably the Westinghouse Company, the Ford Motor Company, and General Motors. Working together makes it possible for the deaf to have a social life while they are on the job and gives them a chance to develop an attitude of self-respect and pride in workmanship. The services of war cripples are being used successfully by many companies.

Every community is attempting to care for the vocational needs of the blind. The inability of the latter to travel, unaccompanied, between their homes and their place of work is being met through the use of trained dog leaders. To the more common occupational fields of handicraft open to them have been added certain business vocations, such as dictaphone transcription, stenotyping, and the like. Many blind persons have made remarkable occupational adjustments. As a result, society is beginning to realize that these people are engaged in gainful work not only as the result of the philanthropic interest of their community in them, but also because they themselves have talents and abilities that they are using for the common welfare. Milton in his blindness is no longer a unique phenomenon. Lesser but equally worthy Miltons have and can make notable social contributions.

The mentally retarded person tends to be a burden to society, especially during periods of economic depression. Unless he has

established habits of sterling character, he gets into trouble with the law. He can be trained to do many forms of much needed manual work and, when he works under proper supervision, is a contented and happy worker.

Selection of a vocation. The task of guiding the vocational choices of the exceptional person is difficult except for the gifted. Since the gifted can train himself to a high degree of performance in most activities in which he is sufficiently interested, selection of a vocation is based largely upon the interest of the individual himself. The situation for the dull is often tragic. He is fortunate if he can secure enough training in the simpler skills to be gainfully employed.

Crippled children should be encouraged to start early those activities which later may contribute to the support of themselves and their families. The nature of the activity to be chosen depends upon the particular disability of the individuals and their chances of success after training. They should not be encouraged to become over-optimistic concerning the extent of their possible accomplishment, but should be helped to appreciate their limitations and the fact that their efforts may not be as productive as those of normal individuals.

The blind and the deaf have abilities equal to those of seeing and hearing persons, and have interests commensurate with their abilities. Yet the prevailing attitude is to train these individuals for the trades, and manual activities. Especially is this true of the deaf. More understanding counselors are needed to help society attain a better attitude toward the problem so that these individuals may be able to train for any type of work for which they have sufficient ability. For the near blind and the hard of hearing, efforts should be made to discover a kind of work in which the individual will have a fair chance of success without further endangering his vision or his hearing.

Adjustment on the job. In active life individuals who possess leadership qualities have an opportunity to forge ahead toward the attainment of whatever degree of accomplishment their energies will permit. Hence the bright are in a position to secure public approval through their successes in one field or another.

On the other hand, the mentally less able and the physically handicapped are faced constantly with the possibility of social

stigma. The fact that they are forced to rely upon others instead of being independent makes their adjustment on the job difficult. However, if they are associated in their work with others like themselves, under intelligent supervision they have opportunities for fellowship and for individual progress in competition with their own kind.

The change of attitude on the part of the public has done much to make adjustments easier for the handicapped. They are now better able to appreciate the point of view of the other fellow, and the latter is more tolerant of their interests, drives, aspirations, and general welfare.

QUESTIONS AND PROBLEMS FOR DISCUSSION

1. If you were the principal of a school in which there was a small group of children with I.Q.'s over 135, and you were requested by the school board to recommend a program suitable for these children, what would you suggest?
2. What are some of the adjustment problems of the gifted that never touch the life of the mentally retarded? Reverse the ability groups and answer the same question.
3. Recall a bright child and describe as many of his traits as you can. In what respects does he differ from the average child?
4. Study the activities, family background, interests, and social and educational development of mentally retarded children and report your observations.
5. What are among the most important adjustment problems of the mentally retarded? The gifted?
6. How may modern activities be a contributing factor to the development of defective vision?
7. List the more important adjustments to be made by the blind or the near blind.
8. What values can accrue to the individual if he hides a slight hearing defect? What harm can result from hiding the fact?
9. Discuss the adjustment problems that result from defective speech. How can they be remedied?
10. What training should individuals have before they attempt to correct speech defects in children?
11. Discuss and evaluate: "The setting up of special classes for exceptional children helps destroy the democratic ideal."
12. What are the dangers involved in becoming sentimental toward the cripple?

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28

BEHAVIOR DRIVES AND ADJUSTMENT

From birth to death an individual is an active organism. He is active with a purpose and his activity is continuous. He strives to satisfy not only his bodily needs but also all those other urges and drives that will enable him to function as an active member of his respective social groups. These drives follow rather definite patterns of behavior adjustment.

THE NATURE OF HUMAN DRIVES AND URGES

Meaning of inner drives. Every human being is born with inner drives that are dynamic forces. They influence his thoughts, his attitudes, his emotions, and his behavior. During the process of his development the extent to which his drives and urges are satisfied or thwarted helps to determine the extent of the desirable adjustment of his personality.

These potential drives and urges with which every individual is born seek expression as he lives and develops. Environmental influences condition the extent to which and the ways in which they will be satisfied. Overt behavior eventually is controlled or directed by these inner drives.

During early childhood these drives are relatively simple, but they increase in number and complexity as an individual matures and enlarges his experiences in a wide variety of life situations. A person usually attempts to direct his interests and desires in such way that he may receive social recognition. No matter what his behavior may be, it is motivated by an impulse to action.

An understanding of human motivation is extremely valuable to us in our human relationships. We often wonder what desire stimulates a particular kind of behavior in another. We sometimes ask ourselves the same question concerning our own actions: "Why did I do that?" or "What impelled me to act as I did?" As we try to discover the underlying reasons for our own behavior or the behavior of others, we are not always successful in finding the motivating forces responsible for this or that form of conduct. Our behavior often reflects the functioning of more than one kind of urge at any one time. In general, however, we are motivated by a felt need (1) to satisfy bodily desires, (2) to achieve a purpose or a goal, or (3) to gain personal satisfaction through social recognition.

Arousal of urges. The environment supplies the stimuli for action and the individual responds in light of the particular urge that is in readiness at the time. For example, a nine-year-old child telephoned to her pal one afternoon that she had her mother's permission to spend a few hours with her in play. As this little girl was about to leave her home, visitors from a distant city arrived at the house. Inner urges were set in conflict and the child had to decide whether to stay and talk with the visitors in her home or to keep her appointment with her pal. She resolved her difficulty by telephoning to her chum, asking to be excused this time since she had company. Her decision in this matter was influenced partly by a desire to boast a little about the coming of the visitors. The relative strength of our inner urges tends to determine the overt responses that we make.

Why do some men play baseball? Why do people differ in their clothes preferences, build different styles of houses, buy different makes of automobiles, possess different food tastes, or engage in different occupations? Is the baseball player interested in the number of spectators, the money he earns by playing, the prestige he may achieve, or his love of the game? Do individuals conform to rules (school rules or the laws of the land) merely because they are expected to do so? Ultimate behavior usually is based upon what is satisfying either at the time or in anticipation.

Motives evolve. Motives arise from inner urges and are expressed in habitual goal-attaining behavior. They are active processes and change with experience. They originate in what-

ever inherent potentialities an individual possesses. The motivated behavior of an individual during infancy and early childhood eventually may become crystallized into adult purposes.

An individual's activities during early childhood tend to be self-centered. Later he is motivated by the suggestions or other influences of individual members of the family or of his playmates toward a growing interest in that which lies outside himself. In his expanding desire to do for others he first attempts to include small intimate groups of his own selection. Gradually these groups reach out to include the entire family, the school, and eventually the community in which he lives. During adolescence and adulthood, a person's activities and interests are affected by his desire to cooperate with the groups in which he is active, such as religious, political, business, and social organizations.

At any stage of individual development motives are colored by personal interests, physical urges, social and economic ambitions, and the like. However, the socializing influences that are present tend constantly to cause motives to follow a definite pattern as an individual develops gradually from childhood to adulthood.

As a result of training and experience a child's social behavior gradually is transformed from one of self-interest to interest in others. Although the past experiences of an individual have some effect upon his overt behavior his motives are affected through the years by imitation, suggestion, and integration. All these serve as dynamic modifiers of behavior. Writing to this point, Driscoll says:

Behavior of individuals is determined by the values they hold important and the satisfactions they secure in daily living. Every person desires understanding, prestige, and an opportunity to contribute. Above all, maintenance of emotional equilibrium requires that life for every individual shall have meaning to him secured from opportunity to find satisfactory expression for his spiritual values.[1]

VALUE OF INNER URGES

Urges associated with bodily needs. Numerous impulses arise in every human being from his bodily needs. An individual yearns for the things that strengthen his feeling of well-being, and

[1] G. P. Driscoll, "What Controls Our Behavior?" *Teachers College Record*, 48:90 (November, 1946).

he strives to avoid anything that may cause him pain or suffering. The primitive cravings are closely associated with biological functions, yet they are responsive to social conditioning when the needs of the situation so require. For example, we establish the habit of eating three times a day and at definite hours of the day; we learn to like food prepared in certain ways; we resist eating food that does not satisfy our taste. Certain foods cannot be eaten by some people because of the associations that have been established with them. Good steak may not be good to a boy if it has come from the leg of a calf that he has raised with personal pride. A girl may refrain from eating good chicken if that particular chicken had been her own particular pet. What experiences have you had with food that make it difficult for you to eat certain kinds, even though they have been well prepared and are pleasing to the taste?

People also are sensitive to values which they have associated with clothing, aside from the fact that the clothing protects them and keeps them warm. A younger brother or sister may be expected to wear the clothes that an older child of the family has outgrown. The important issue here is not that the child is wearing a hand-me-down but rather that the fact is known to others. The condition of the clothing may be excellent, yet the individual who wears it tends to rebel at the thought of doing so. Nevertheless, the economic need in the family may be so great that the child either must wear the hand-me-down or go without. In an instance of this kind the protective value of the clothing eventually may offset the hurt to the child's pride.

The urge to be successful. The success factor is important in education. It serves as a motivating force that is more significant than many have believed. The achieving of success is a powerful factor in child training and in effective child living. Given a satisfying degree of successful achievement, a child or an adult may strive for hours to attain a goal that may seem to be relatively insignificant. Feelings of satisfaction accrue from planning an action, perfecting a skill, or solving a problem, even though it may be only a crossword puzzle. The pleasure derived from success-producing activity becomes the motivating force that stimulates similar attempts at other times.

Teachers know that learners differ from one another in their interests and in their capacity to learn. Administrators and

teachers, therefore, should organize their training programs in terms of the ability, the interests, and the experiential background of the individual student so that he will be encouraged toward further activity by his anticipated successful achievement. Each learner should be provided with problem situations that are relatively difficult but within his mental grasp.

The urge to avoid failure. Observe a child who has been striving to complete an assignment but who fails to reach successful achievement. How does his failure affect him? Does he carry his head erect or does it droop? Are his muscles flexed or limp? Do his eyes sparkle or do they appear dull?

Careful observation of the child who is experiencing failure reveals that failure tends to discourage initiative. The learner needs to be motivated. Hence learning can be stimulated by well-planned and well-thought-through techniques. However, what may motivate one learner may not motivate another. Teachers should emphasize success and should make it possible for their pupils to experience some progress even though it is achieved slowly. Teachers who emphasize failure are not stimulating in their pupils a will to learn.

Instruction should be so individualized that the child will be able to grow progressively through his experiences. The danger of failure must never become a major fear in the life of a child, since it may become so powerful a force that it inhibits his ability to perform and he loses efficiency in the presence of fear-producing stimuli. An expectation of success, on the other hand, can build up in the child satisfactory efficiency and a strong interest in what he is doing.

The fact of failure cannot be eliminated from learning situations, but the *fear of failure* as a deterring force should be removed to as great extent as possible. Both teachers and supervisors are potential stimuli of fear. Little do they realize the extent to which they create fear in sensitive learners. In a similar way supervisors are fear-producing stimuli for teachers. Each pupil or teacher should be stimulated to work to the full extent of his capacity, and adequate constructive help should be provided to make this possible.

Urge for mastery. A dominant urge underlying human behavior is that of being able to do something better than someone else. Satisfaction does not come merely with doing some-

thing or even doing it well. Much more important is the knowledge that in this activity or skill the individual is *superior* to others. Alfred Adler [2] believes that the urge for mastery is one of the strongest directors of social behavior; some psychologists, however, do not agree entirely with this point of view. Nevertheless, the exercise of this urge is fundamental to individual development. An individual seeks to gain attention and approval from others through his accomplishments, and when this results in a social good, it is wholesome and desirable.

Occasionally an individual's attempts at establishing superiority in an activity or situation are responses to a realization on his part of his own weakness. For example, an uninformed person may be much more assertive in his expression of opinions than is the individual who is more thoroughly acquainted with the issue in question. When this feeling of inferiority is compensated for through the use of a socially desirable activity, the effect is likely to be beneficial. On the other hand, if the individual attempts to achieve superiority through the utilization of a socially unaccepted technique, the total effect will be undesirable. This latter individual should be encouraged to participate in those activities in which he can earn success and thus achieve some feeling of superiority over others. He thereby can become the master of a definite, though perhaps simple, field of knowledge or skill and of himself as well.

It is unfortunate for an individual to turn to unfair means of satisfying the mastery urge. To cheat, to lie, to steal, or to use any other form of subterfuge to secure the approval of others that gives a feeling of superiority is likely to be harmful to the individual himself and to the group affected. However, the urge for mastery is strong. Combined with the urge to avoid failure the mastery urge operates to serve as a strong motivating force for the individual that causes a reduction in his moral stamina. An individual who is affected thus by his inner urges needs sympathetic help the first time that he gives evidence of this attitude. The wise parent and teacher will not desert the victim at this time, but will attempt to provide an opportunity for him to regain his self-respect and the good opinion of others. Too often a single misstep, such as cheating in a test, labels a child as a cheater for the remainder of his stay in that school.

[2] A. Adler, *Understanding Human Nature.* Greenberg, Publishers, New York, 1927.

The urge for recognition and approval. A child begins at an early age to play to the gallery. He craves attention. He wants his behavior to be approved. In fact, this urge is associated closely with the success drive. Its functioning, however, concerns the attitude of others as well as the inner satisfactions connected with successful achievement. A feeling of satisfaction is the accompaniment of the successful completion of a project or of an activity. This feeling is made all the more pleasant when the completion of the activity receives group approval and recognition. In school, when a child fails to receive the recognition and approval for his efforts that he believes to be his due, he devises other ways and means of gaining the attention of the teacher or of his classmates. Sometimes the techniques used are anti-social or undesirable, even though for the child himself they may bring hoped-for results. Skill in operating a bean-shooter may satisfy a boy's immediate desire for approval by gaining for him the admiration of some of his classmates, even though it earns the disapproval of the teacher.

In his own way, every person seeks approval and recognition in various situations. A boy may use excellent English in the classroom but employ a kind of street jargon on the playground. A girl will not go down the street until she changes her dress; the baseball player keeps an eye on the crowd; and the teacher tries his best to please his supervisor. Inherent in all such activities is a desire for recognition and approval.

Success seems to come easily to some people. Babe Ruth never had to wait for approval when he was at the height of his game. In a classroom there are always some children who seem to be successful and to gain approval in abundance. They present no great problem to the teacher. Many of the teacher's problems are caused by the boys and girls who seldom seem to be able to win commendation. They are starved for this recognition and should be watched carefully by the teacher so that he may find ways in which he honestly can give them some form of the praise and attention which they so strongly desire. The adult as well as the child appreciates approval. The housewife has a definite cause for the complaint that she is no more than a part of the household fixtures if she receives little or no praise for a well-kept home and tastefully prepared meals, but is criticized severely for the first soggy cake that she dares to serve.

The administrator, the teacher, and the businessman all know the value of the wise use of praise. Approval of work well done or even of the effort to do it well will gain in cooperation what criticism can never hope to accomplish. Praise, however, should be given only when it is actually deserved; otherwise it may be looked upon as empty words and a kind of bribe. To evaluate critically either production or behavior is the duty of the teacher in the development of attitudes which will function in living.

The urge for sympathy and affection. Individuals desire to extend and to receive sympathy although giving or receiving it may be difficult. A person seeks sympathy partly because he wants the attention of others. The sympathetic word or action is interpreted by him to mean that the person offering it is interested in his problems and welfare. To be able to talk to someone about a trying situation is tension-relieving. A child who has a problem to solve or who has solved a problem that bothered him gains great satisfaction from the sympathetic attention that he receives from the adult or from the other child to whom he recounts his troubles. When a child injures himself, the pain does not seem severe if he knows that others realize that he is suffering. The child as well as the older individual appreciates the fact that others are interested enough in him to extend sympathy to him in times of suffering or sadness.

Sometimes an individual solicits sympathy. Harm as well as good can come from ill-extended sympathy. There should be an important and real reason for proffering it, and it should not be given just because it is desired or sought. However, at best, sympathy is difficult to extend since it is an emotional experience and many persons lack fluency in expressing their deep feelings. Hence real sympathy usually is expressed better in actions than in words. Fortunately, a person usually knows when and if the sympathy offered is sincere or a mere conventional expression.

Similarly, affection does not require words for its expression. Admiration often shows itself in action before it is put into words. Long before the boy has told the girl that he loves her she may have experienced his affection through his behavior. She usually can tell when he is making pretty speeches and when he is sincere. Although experienced talkers may be so effective that they give a show of sincerity which is not present, deep

affection for another expressed in actions as well as in words is a most satisfying experience which becomes doubly so when the other returns the affection.

The urge for security. To be secure in the affection of another is one of the fundamental inner urges. A feeling of insecurity leads to maladjustment. An individual should make an effort so to cooperate with others that he earns the respect and admiration of his classmates, co-workers, members of his own family, and friends and associates. Satisfactory life adjustment for any person rests upon these emotional relationships as well as upon reasonable certainty that he has a satisfactory job which will ensure for him financial security.

Although economic security is born of the environment, it is important to the individual both mentally and emotionally. Those positions that offer tenure and pension rights are taking precedence over more highly paid forms of work in their appeal to individuals who want peace of mind that is achieved through the elimination of a kind of emotional strain that accompanies the possibility of economic insecurity. All forms of insurance plans have increased in popularity as the result of individuals' interest in providing financial security for themselves and their families.

The fact that directly after birth an infant probably needs to experience a feeling of security has led to the recommendation that newborn children should remain in the hospital room of their mothers rather than be segregated in a special room, in spite of the hygienic values of such segregation. The mothers then can pick up their babies, feed them when they are hungry, and by gently cuddling them provide them with a feeling of emotional security.

The urge for adventure. The urge to experience the new and the different is normal for all human beings. It is limited, however, in its extent and form of expression by the numerous restrictions that are imposed upon an individual's behavior by social codes. These standards of conduct have evolved for the good of society. In order to survive, each individual is responsible for developing a respect for those values that will serve him and the group to the best interest of all.

The spirit of adventure usually is satisfied easily in children. They play for a short time at one thing and then at another.

They are curious and constantly are learning something new as they seek to satisfy their curiosity. The adult, on the other hand, often has to find outlets apart from his routinized work for the satisfaction of this urge. Too often he turns to gambling or to another form of undesirable social activity.

There is something exciting about the new and the different. It is normal to want to buy a new hat or a new car or to see a new scene, or a new building, or a new play. As life's activities become increasingly routinized many individuals are denied the privilege of giving expression to these drives for adventure. However, many learn to satisfy this drive for adventure in the laboratory, in the classroom with a group of active children, or in the caisson that is used to dig tunnels under rivers. The artist and the author constantly are seeking new and different ideas to which they may give expression. Every individual in his own way is living face to face with the possibilities of discovering the new and the different.

Television is opening up areas that will make it possible to experience the new and the different and to satisfy the drive for adventure in many ways. As a person sits comfortably in his home he is taken to the shop, the office, the factory, the ball park, and national and international meeting places. He is enabled to enjoy the beauty of nature or to participate in events that may be happening anywhere in the land. In a similar way the teacher has the experiential background and material to satisfy vicariously the spirit of adventure in his pupils through the many visual aids the school offers, as well as by means of stimulating classroom discussions. Thus, the entire school experience can become a new adventure. Awaken interest in a learner and he will find as much enjoyment in working with ideas as he will experience in going places and seeing things.

The sex urge. At maturity this urge is powerful and biologically important, since the continuance of the human race depends upon it. Animals have been known to endure severe pain to satisfy this drive. Some human beings likewise knowingly face the danger of disease in their attempts at giving unbridled expression to the satisfaction of the sex urge.

This physical drive is more constant in the human being than it is in other animals. Man differs from other animals also in his capacity for thinking, feeling, and remembering the emotional

satisfactions which accompany the physical and biological experiences. Moreover, it is through the operation of the sex drive that man has been enabled to use his creative abilities for world betterment. The persistency of this urge makes individual control and attitude development necessary in an advancing civilization.

There is a psycho-sexual development which includes the thoughts, feelings, and emotional attitudes that accompany the physical maturing of the reproductive organs. These mental attitudes are influenced by the inner nature of man and by environmental and educational factors, factors of which the child becomes increasingly aware in his environment. Especially significant are the sentiments and attitudes of the persons who comprise his immediate world. As a result, he develops certain mental and emotional patterns or ways of thinking and feeling that give him his social attitude toward sex and, to that extent, condition the functioning of his sex drive.

The child should be helped through his early home training to develop controlled attitudes toward sex and to be given the kind of information concerning physical structure and physiological functions that will help him to build strong, wholesome attitudes toward members of the opposite sex in his day-by-day living. The sex drive is fundamental to biological and social living. If it is properly guided it can be of great service in the realization of ethical and social values. Sex interest should be understood for what it is — an important and desirable normal biological life function that, however, needs proper direction.

The training of every individual should include emphasis upon the control of the sex impulse until expression can be given to it through marriage. Extramarital sexual experiences, in spite of certain present practices, should be frowned upon as undesirable, unnatural, and harmful to the individual and to society. Masturbation should likewise be recognized as nonessential to the developing life of an individual. This practice should be side-stepped for more desirable behavior and better use of the individual's time and energy. In addition to the moral or ethical aspects, there are many advantages in an individual's living a chaste life. For example, he need not fear the contraction of a venereal disease, and he is more than likely to win the respect and admiration of his associates. However, the active young

person does not always recognize these advantages until it is too late. Too often he responds to the suggestions of uncontrolled members of his group.

Conflicts. Conflicts arise when an individual is faced with forces in his environment that act in opposition to his own interests and desires. Social codes, the interests of others, competitive situations, and thwarting of drives may cause mental and emotional conflicts that usually are undesirable because they dissipate energy, create emotional tension, and in general affect adversely an individual's well-being.

Inner urges impel an individual to action and the environment tends to give direction to the form of behavior that may result. It may seem to the individual that his own self-centered interests face frustrating forces at every turn. This sets up within him conflicts that need to be resolved. An individual must learn to meet and to face unsatisfying situations and to make adequate adjustments to them. Mental and emotional growth result from adjustments of this kind. Many persons are able to solve their conflicts satisfactorily. Some conflicts are relatively easy to resolve; others are almost insurmountable.

Children should be trained to meet failure and disappointment. They need controlled freedom so that they may meet and solve the problems which confront them. The young child or the adolescent needs to participate in group experiences if he is to develop the feeling of well-being. He cannot be inactive. His energies should be applied to participation in challenging activity directed toward a worth-while goal which will so engage his attention that devastating conflicts are crowded out of his mental life.

In his attempt to make satisfactory adjustments to life situations, the individual utilizes, in one form or another, many of the so-called mechanisms of adjustment. Unfortunately, some individuals fail to make satisfactory adjustment to the frustrations which they encounter and the circumstances and forces by which they are faced.

The resolution of the more serious mental or emotional conflicts requires psychiatric treatment. The mental patient may be helped to discard his fears and anxieties through psychotherapy that includes suggestion and persuasion, and the recall of repressed memories of experiences that have been the real

causes of the conflict. Therapy should be based upon an **under-standing** of cause and effect so that the individual can review his own problems more objectively and secure more or less permanent beneficial results as he tries to resolve his conflicts.

ADJUSTMENT MECHANISMS

Meaning. As has been said earlier, human drives and urges impel an individual toward the realization of definite interests and ideals. When the resulting behavior is satisfactory to the individual and society, there is said to be adjustment. However, if behavior responses are not adequate or satisfying, another pattern of behavior is acquired. This changed behavior is generally referred to as a mechanism of adjustment that is a learned response tending to reduce an inner urge and to result in either individual or social satisfaction.

In many cases the newly established patterns are in keeping with socially desirable goals. However, the individual may have warped ideas concerning the nature of the goals to be achieved or his own ability to attain them. In either case he attempts to bring about an adjustment of his behavior through the utilization of a mechanism that may seem to satisfy his impulse at the time. The result is either wholesome adjustment or more or less serious maladjustment. At this point we shall discuss various mechanisms, any one of which an individual may attempt to utilize as a means of resolving a conflict.

Compensation. When an individual utilizes extra energy to alleviate the tensions caused by a real or imagined defect, he is said to be engaging in compensatory behavior. The operation of this mechanism is observable in the behavior of short men who become assertive or aggressive, in tall girls who sometimes do all that they can to accentuate their height, or in the cripple who resents assistance and who attempts to participate in activities too strenuous even for the normal person. In general, compensation takes the form of developing potential strength, of covering up a weakness, of boasting, of assuming an attitude of superiority, of attempting to be overhumorous or of clowning.

Parents sometimes compensate for their own limitations by providing (perhaps at great sacrifice to themselves) special advanced training for their children. They may attempt to steer their children into vocations which they themselves had

wished to enter but had failed to. Compensation also is exemplified by the unduly stout boy who may overexert in order to divert attention from his size; or by the man reaching his sixties who may attempt to show that he is still active by playing more holes of golf in a day than he should, or by dancing or playing ball longer than is good for him.

Many satisfactory adjustments can be made through compensation. There is, however, danger in overcompensation. In order to break one habit an individual may give free rein to another equally harmful. Energy expended in compensatory behavior should act as a reducer of inner tensions, otherwise maladjustment — not adjustment — is likely to result.

Attention-getting. It is normal to want to attract attention to oneself. If an individual is unable to secure the approval of the group he would rather gain disapproval than be ignored. The child receives so much attention during his early years that he is stimulated to continue behaving in such ways that he will be assured of receiving attention. This attitude may cause misbehavior in school until the child is able to make a satisfactory adjustment. Often a child does not hesitate to become disobedient in order to attract attention if it is not otherwise forthcoming.

Crying without physical cause, throwing things, and refusing to eat are attention-getting behavior techniques that are often found among young children. These simple attempts at attention-getting have adjustment value for the individual if they are not allowed to get out of hand. Each age group has its own set of experiences that are utilized by the growing young person as he attempts to adjust to the developing process.

Much youthful behavior that is considered delinquent can be traced to some form of attention-getting attempts. Thwarting of a desire to excel, being unduly ignored, or lack of recognition by others of attempts at cooperation may lead eventually to delinquency. Both school people and parents are becoming more and more aware of the need of extending wholesome attention to the interests and activities of children.

Identification. An individual may attempt to gain personal satisfaction from the behavior of other people. Any group usually includes one or more members who excel in one or another form of activity. Other members of the group then

experience great satisfaction as they bask in the glory of the achievement of that person. The "fan" on the sidelines experiences a definite share in the victory achieved by the team for which he is rooting. He identifies himself with each success made by his "idol," whether that be the team itself or a member of it.

In the home the girl often identifies herself with her mother and the boy with his father. To the extent that the young person admires an older adult he experiences a feeling of security in this identification. A growing child often imitates unconsciously the behavior, mannerisms, opinions, and attitudes of his elders. When the imitation is directed toward desirable traits it should be encouraged as a wholesome means of personality development. Each individual should want to develop strong traits in himself rather than to attempt to bask in the glory of the achievements of others who are more proficient or experienced than himself. Identification is one of the important factors in character formation; through its utilization an individual is helped to imitate those parental and group qualities that are worthy of imitation.

Children often identify themselves with teachers, with class heroes, with motion picture stars, and with successful business men or other well-known leaders. When children "play school" they usually mimic the teacher's good and bad characteristics. The child reading a story tends to live the life of the hero or heroine. Later, the individual identifies himself with special organizations, such as clubs, fraternities, or religious or political groups. He is proud of the reputation of his group and sings its praise in proportion to his own lack of participation in its activities.

An individual also may identify himself with his possessions — his clothes, his jewelry, his automobile, his home, his work, or his children — with an apparent belief on his part that his possessions are endowed with qualities distinct from and superior to those of other persons. Such identification is not desirable, since it leads to boasting which is both boring and wasteful of time. However, identification with a person who is worthy of imitation or with a group that has high ideals often develops gradually in the individual a form of behavior that is very much like that of the individual or individuals imitated. The person himself then rightfully may become a model for others.

Identification, however, is undesirable when a person loses his own individuality so that he no longer is conscious of himself as a person but takes on in thought and in action the personality of his hero. Among the mentally ill, this form of identification is quite common. It usually is one of the early observable symptoms of mental disorder. The individual who believes himself to be Napoleon or who announces that he has the wealth of Rockefeller is an example of maladjustment that takes the form of extreme identification. Care should be taken that children do not identify themselves so closely with crime heroes and thrilling "bad men" that they attempt to emulate the kind of behavior in which their models engage. Identification should help an individual to bolster his own self-esteem. Therefore, whatever can be done to increase a person's feeling of worth or importance will tend to increase his sense of security. When this is socially acceptable, it is to be encouraged.

Projection. Individuals make mistakes but at the same time usually dislike to admit their errors. Hence it is more satisfying to an individual to place the blame for his failure on other persons or objects rather than to accept it as his own. The pupil places the blame for his failure on the teacher, the housewife on the knife when she cuts her finger, the pilot on the mechanism of the plane when an accident occurs. The attempt to hold others responsible for one's own behavior is called *projection*. There are many examples of such attempts at projection. An individual, moreover, should not develop the habit of calling attention to undesirable behavior or motives or failure of others as a means of diverting attention from his own shortcomings.

The teacher gave the wrong questions, the stove will not bake, the clothes are not attractive, the road was at fault — these represent the kinds of reasons often given by an individual for his own inadequacy. In many instances there may be some truth in the projected reason for failure, but the user of this mechanism knows that he is trying deliberately to place the blame on other persons or things. The pupil who cheats finds comfort in thinking or imagining that other pupils cheat even more than he does. Also, he convinces himself that his swearing, his whispering, or his lying is not so serious as are the bad habits of his associates.

Rationalization. Rationalization is an attempt to excuse behavior that is recognized to be undesirable or foolish. An action, opinion, feeling, or situation is justified by devising acceptable reasons other than the actual ones. This mechanism is utilized for the purpose of saving face. It usually helps an individual to maintain his self-esteem as he attempts to justify his behavior in terms of conventional custom or mores. A woman is shown a television set. It is expensive. She needs her money for other things but she buys the set. In order to justify her extravagance she tells herself and others that her husband expects a visit from his employer and that she should be prepared to entertain him properly in order that she may not discredit her husband and herself.

It is not always easy for an individual to admit to himself or to others the true reasons for his behavior. Attempts at self-deception may appear more frequently as standards of conduct or ideals of living become higher but means of attaining them less adequate. As an individual tells himself or others "white lies" about his conduct, he deceives no one but himself.

Some expressions of rationalization are used and accepted without much thought of their significance. Among these are: I can't spell anyway; good thinkers are poor penmen; I am too busy to bother about details; he who can does, otherwise he teaches; I'd hate to be teacher's pet. In these expressions can be seen attempts to explain behavior in terms of a desire to build up self-esteem and to maintain prestige by belittling that which one does not possess or cannot achieve.

Consideration for the feelings of others, high sense of duty, exceptionally good manners, or great responsibilities often are offered as forms of excuse for failure, with the hope that they will be accepted as plausible explanations. If with the rationalization goes the determination to improve behavior, the results may be favorable. Society will permit adjustment through self-bolstering devices. However, if this mechanism is utilized consistently as a means of self-justification for undesirable conduct, the group soon learns to resent the implications, and unfriendly attitudes arise.

Daydreaming. Some problems are avoided in reality but are solved satisfactorily in imagination. The tendency to gain success in imaginary achievement when the success is not

immediately possible of actual attainment is an overworked form of self-satisfaction. When the energy used in imagining becomes preparation for later actual accomplishment, it is a desirable form of adjustment. It is when an individual permits himself to gain his personal satisfactions in a world of dream life or fantasy and becomes separated from reality that there may be evidenced the beginnings of serious maladjustment.

An individual sometimes is enabled through his daydreams to achieve in fantasy what he may not be able to achieve in reality. It is harmless to dream about being popular, but one will never become popular until he does something about it — something that will attract the attention of others. In daydreaming the imagination is allowed to play with ideas that are basic to the realization of desired goals or purposes. This kind of daydreaming is harmless, if it is not carried to extremes. Harmful results are more likely to occur when daydreaming interferes with the pursuit of normal and necessary activities.

To the young child his dream world is his real world. The fairies, goblins, brave princes, and beautiful princesses that people his world of fantasy are as real to him as are the people and objects about him. However, real rather than imaginary people, things, and experiences gradually should become the center of the thinking and attention of children so that they will not live too long in the world of fantasy.

During early adolescence, dreams of things to be done in the future are common. The majority of our young people are stimulated by success stories of adults long before they are old enough to participate in adult activities. Fortunate is the young person who early centers his attention on the activity he hopes to pursue as his life's vocation. His dreams of conquest may serve to stimulate him toward the achievement of high ideals and purposes. It is when the dream life is not related to real situations or is used as a device for partial or entire wish fulfillment that the daydreams or fantasies may lead to dangerous consequences. Dreams of future success, if they have a basis in fact, may serve as incentives toward self-improvement and self-realization.

Sublimation. Some writers limit the meaning of sublimation to the redirecting of the sex urge away from immediate expression toward higher, more cultural and socially acceptable,

forms of behavior. In a more general connotation of the term, sublimation may be defined as the unconscious process whereby an individual's urges and drives are up-stepped from lower to higher forms of behavior. Socially acceptable goals are substituted for sexual drives, and other primitive emotional reactions are directed toward socially approved levels.

Through sublimation an individual finds an excellent release of energy into channels of conduct that will be satisfying both to himself and to those who are affected by his behavior. Its utilization may become necessary when certain natural interests or activities are temporarily impossible of realization or when society may be harmed by individual satisfaction of inner urges. Selfish interests thereby are replaced by those of the group. According to Sadler:

Our anger is up-stepped to a higher form of resentment called righteous indignation; our bestial sex impulses are advanced to the more glorified phases of romantic courtship and marital devotion; our early and barbaric instincts of torture and cruelty become transmuted into our comparatively harmless proclivities of teasing, bantering and joking. Thus are our early and inhuman urges finally transmuted into our play-life and civilized humor.[3]

Much creative work results from sublimation. Music, art, and literature may be explained in part as the sublimated outpouring of emotional energy. Childless men and women may become active in providing for the welfare, health, and safety of all children. Childless women or women whose children are adults and have moved away from the home often sublimate their maternal urges through teaching or social welfare work. This is a tension-reducing mechanism that operates for the benefit of the individual and the group.

Withdrawal. This mechanism of adjustment shows itself in the behavior of an individual who retreats from an unsatisfying situation or situations to which he cannot adjust. Some individuals withdraw completely and others only partially; some for long periods at a time and others temporarily; some as the result of vocational failures and others to evade the meeting of responsibility. So strong may be the desire for withdrawal that

[3] From W. S. Sadler, *The Mind at Mischief*, p. 117. Copyright, 1929, by Funk and Wagnalls Company.

the individual refuses to participate in any normal associations, even to the extent of locking himself in his room to avoid them.

Individuals who are not prepared to meet a new situation exhibit at times a normal timidity which wears off as they become increasingly familiar with the requirements of the situation. A shy child in the classroom may seem to be well adjusted because he disturbs no one. However, an aggressive and annoying child may be the better adjusted of the two. The timid child is the delight of the teacher since he causes no trouble in the classroom, but this child may be suffering from a form of maladjustment that, if allowed to persist, later may require the services of a psychiatrist.

There are several types of withdrawing mechanisms. Among these can be included (1) shyness and seclusiveness; (2) negativism and refusal; (3) regression; and (4) daydreaming. Although daydreaming has many of the characteristics of the withdrawal mechanism, it is here treated separately since in the majority of instances the individual through his dream activities may bring about a normal adjustment. A brief discussion of the others follows.

Shyness. Most individuals are shy in certain situations. If a child has been overprotected, has experienced a lonely childhood, or has been disciplined too strictly by his parents he may need a great deal of help in adjusting to his broader life situations. Often beneath his quiet external behavior there may be emotional tension and frustration caused by his strong desire to participate, coupled with the fear that he may not succeed as well as others believe that he should. This conflict is likely to result in still further withdrawal unless the teacher or group leader is alert to what is happening and helps him to enter into participation in the group activity. An understanding of child nature is extremely valuable at a time like this. The following example will help to clarify this point.

Jane, a first term student in high school, was the daughter of a relatively ignorant and apathetic mother and of a father who died, when Jane was a baby, in a sanitarium for the mentally ill. Jane's mother remarried a poor but sincere man who treated his stepdaughter with kindness but gave her little attention. The girl received her elementary school training in a parochial school where she was a good and obedient child. However, in

high school she found it difficult to adjust to the freedom of behavior that was exhibited by other students. She developed a mild case of acne which resulted in her refusing to attend school because she thought all the girls were looking at her. She was persuaded to return to school and her program was adjusted to meet her interests and needs. She still found it difficult to mingle with large groups and developed the habit of disappearing from her classrooms. For a semester her teachers escorted her personally from one recitation room to another. She was a bright girl and gradually earned good marks which helped her to overcome her aversion to school. Each term, however, she needed to become adjusted to new teachers and to new student groups, with the help of her teachers and guidance counselor.

Negativism. Negativism is a mechanism in which the individual shows behavior that is characteristically rebellious against the authority or the suggestions of other persons. This attitude is common among young children. At one point in their development children consistently give a negative response to any request or suggestion made to them. This reaction, expressed vocally or by gesture, is not deep-seated; in many instances the children comply with the request while orally refusing to do so. However, there are times when temper tantrums, stiffening of the body, or other forms of bodily resistance accompany these refusals. Children who are properly treated on such occasions are likely to come out of this phase of their development without any harmful effects.

By his negativistic attitude the child is striving to preserve his ego and hence guards his behavior carefully lest any inadequacy be discovered. If parents and teachers overtax his physical strength or mental power to perform, negativism may tend to persist. If tasks and requests are kept within the limits of his ability to understand and to do, he is likely to move out of a negative attitude rather easily and quickly. Much more serious are the contradictory attitudes, stubborn behavior, and expressed rebellion against authority of the adolescent or adult whose noncooperating habits may have their beginnings in lack of training during childhood.

Regression. The utilization of behavior patterns that brought satisfaction during an earlier developmental period of the in-

dividual is descriptive of this mechanism. A person who was protected by his parents and relieved from making decisions for himself during his childhood may derive great satisfaction at a later time by returning to the earlier sheltered life experience. If he is unable to meet the demands of his present environment he may revert unconsciously in his behavior to an earlier stage of development in which he had found satisfaction.

This form of behavior may show itself at any time during life. If a child of three or four years of age comes to resent the attention that his newborn brother is receiving, he may insist upon being helped in activities such as eating, dressing, preparing for bed, and the like, although before the advent of his little rival for the affection of his parents he had been accustomed to perform these activities unaided. College students away from home sometimes develop an uncontrollable feeling of homesickness that impels them to leave college and return to the comforts and satisfactions of the home and the sympathetic care of parents. It is not uncommon for a young married woman to convince herself that her husband does not give her the consideration that she received from her parents. A slight, unimportant difference of opinion between the two may cause her to retreat temporarily at least to her childhood home.

Memories of childish pleasures are less likely to cause an individual to retreat or regress to childhood behavior patterns if he is kept active in worth-while experiences in his progressively changing life. A well-adjusted and active person who possesses many interests has neither time nor desire to relive an earlier stage of his development. Inability to concentrate one's interests upon present responsibilities and associations, accompanied by consequent yearning for the past, may develop into a serious form of maladjustment.

Repression. Repression represents an unconscious attempt by the individual to exclude from his thinking patterns and motor expression those impulses which would be painful if they were brought to the level of consciousness. A person tries to forget the details of an experience that has been very unpleasant or humiliating unless such an experience is so rare that his sense of humor allows him to accept it for what it is worth. Forgetting is a normal mental process that is experienced to a greater or less degree by everyone. In repression, however, an individual

wants to forget, although he may do so unconsciously. Instead of reducing tensions the utilization of this mechanism tends to increase them.

Most individuals seem to be able to avoid any situation that may be associated with an unpleasant experience and to inhibit any inner stimulation that might help to recall it. Although there are differences among people in the extent to which this is true, individuals consciously try to forget experiences that may cause a feeling of shame, embarrassment, or dissatisfaction. It is only when the memory of an experience of this kind persists in coming to the surface of consciousness and is as persistently thrust aside that the situation becomes serious. Repression often is associated with an individual's sex life. The basic sex urge should be sublimated rather than completely repressed. Adequate repression of the sex drive, however, rather than unbridled expression is desirable both for the individual and for society.

QUESTIONS AND TOPICS FOR DISCUSSION

1. In what ways can the approval of a teacher become a motivating force in the life of a child?
2. What attitude shall a parent or a teacher display toward a child who talks a great deal about what he expects to do in life?
3. Name some of the urges that are common both to human beings and to other forms of animal life.
4. Select two drives that at one time or another you have satisfied in unwholesome ways. In what way might you have improved your behavior at the time?
5. What can the school do to make failure a less powerful influence in the life of learners?
6. To what extent and in what ways do you attempt to attract the members of the opposite sex?
7. How do the motives of children differ from those of adolescents? From those of adults?
8. What are the conflicts that you experience? How do you resolve your conflicts?
9. Report a personal experience in connection with joining a club or a new group. What were the problems you had to resolve? How did you resolve them?
10. In what situations have you found yourself that threatened your self-respect?
11. To what extent do you use the mechanism of projection? Give examples.

12. Give several examples of the use of the mechanism of compensation.

13. How can a child be helped if he exhibits an abnormal form of withdrawal behavior?

14. List some of the significant conflicts that arise in the school life and in the home life of a child. Indicate how they can be resolved.

15. What is the most important conflict with which you believe you are now faced? What are you doing to resolve it?

16. What kind of sex education is best for the developing individual?

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APPLYING MENTAL HYGIENE TO INDIVIDUAL ADJUSTMENT

T$_{HIS}$ chapter presents the functions and value of mental hygiene in a program of individual adjustment, and is restricted to (1) a brief consideration of the problems which arise among young people as they attempt to achieve adulthood; (2) a description of those factors of human development to which may be applied hygienic principles of adjustment; and (3) a short presentation of guidance techniques for child adjustment that are utilized in the school.

ADJUSTMENT PROBLEMS OF INDIVIDUALS

If a cross section of the population were studied during any generation there could be found in any generally well-adjusted group some persons of all ages who would exhibit more or less serious symptoms of emotional stress and maladjustment. During a period of national or world crisis the number of such individuals increases. Young people especially may become seriously affected by the disturbed conditions around them. Whatever the causes of youthful maladjustment or however serious the problem, reconditioning of those who already are maladjusted and prevention of disturbance among the others become the responsibility of all who are interested in the welfare of young people — parents, teachers, and other community leaders who themselves are emotionally stable persons.

War and its aftermath take a heavy toll in their effect upon young people. With the onset of World War II, production

increased to so great an extent and the demand for workers became so acute that thousands of young people below the age of eighteen left school for highly paid jobs. Their success in the world of work encouraged in some of these young people an undesirable independence of attitude and behavior not only toward their employers but also toward the members of their families.

The induction into the armed forces of boys over eighteen interfered with their normal educational and social development. The transplanting of these boys from their accustomed home environments and activities to military camps and changed modes of life was a factor of disturbance for all except the most adaptable among them. The uncertainty of survival combined with new and sometimes devastating experiences constituted a further factor of maladjustment.

In many cities, the presence of uniformed boys and men aroused among girls and young women abnormal sex attitudes and behavior. Hastily formed friendships resulted in marriage or illicit relations before the young people had had an opportunity really to know one another. The aftermath of such experience was characterized in many instances by disappointment, regrets, self-recriminations, and mental and emotional breakdown.

During the reconstruction period that followed the war there were few persons who did not experience more or less serious problems of adjustment to a changed world. In general, emotional disturbance and maladjusted behavior were more prevalent among adolescents than among mature adults. The release from war tension, the shifting of individual endeavor from wartime need to peacetime activities, the readjustment in job placement, and the reconstruction of the economic system combined to develop a kind of bewilderment among young people which led to the breakdown of habitual forms of behavior.

Children born during periods of stress and strain too often are likely to reflect in their own attitude and behavior the effects of the disturbed conditions by which they are surrounded. The efforts of their parents toward readjustment, the reports of continued world disagreement, and social and economic problems in their own immediate environment cannot leave even small children untouched. There is lacking the experiencing of that

security which is so necessary to the child if he is to develop normally. Everyone interested in child welfare is faced, and will be for some time to come, with the task of helping our young people to overcome the maladjusting factors of present-day strife and strain.

THE NEED AND FUNCTION OF MENTAL HYGIENE

Whatever can be done to develop an emotionally stable citizenry must begin by an evaluation of (1) the potential strength of young people as this is measured indirectly through their heritage, and (2) the educational and other environmental influences which during childhood and adolescence direct their interests, attitudes, and activities. The importance of physical health cannot be overestimated. Equally significant is the mental health of an individual. The person who lacks confidence in himself and in others, who allows himself to become unduly alarmed or worried by everyday affairs, who builds up envies, jealousies, and resentments, or who becomes too aggressive or self-centered in his dealings with his associates is a liability not only to himself but also to any community of which he is a member.

Practical experience demonstrates the fact that present conditions predispose toward the development of one or another form of mental disturbance. It is estimated that over eight million Americans are afflicted with some degree of mental illness. A primary function of anyone who works with young people is the maintenance of sound mental health among those whom he is attempting to guide. The function of the leaders and directors of young people overlaps to the extent that, in their respective fields of work, they all emphasize the preservation of mental health and the consequent prevention of mental illness. It is the expert — psychologist or psychiatrist — to whom we must turn for assistance in the therapeutic treatment of those persons who are experiencing any form of mental illness.

The science of mental hygiene deals with human welfare and pervades all fields of human relationships. The three major purposes of mental hygiene are (1) the development of an understanding of the relationship that exists between personality development and life experiences, (2) the preservation and improvement of the mental health of the individual and of the

group, and (3) the discovery and use of techniques through which assistance can be given to those who are mentally ill.

It is the responsibility of all persons who work with young people to assume the task of preventing mental illness and of preserving mental health. Parents, school people, religious and social workers, and employers need to know the particular dangers to mental health that are inherent in the environmental conditions of the times. Furthermore, they should so adjust these conditions to the young people with whom they are working or should so help the young people to adjust to those factors which cannot be altered that there will be a minimum incidence of mental illness.

ADJUSTMENT DURING CHILDHOOD AND ADOLESCENCE

Physical well-being. An individual's physical constitution is perhaps the most obvious factor of his personality. All with whom he associates are responsive to his build, his attractiveness of appearance, and his vigor. Some of these physical traits adapt themselves to training. Parents, therefore, with the help of the school should know and apply the principles of physical hygiene so that children establish desirable health and personal habits early in life.

Hygienic feeding and sleeping habits are basic to good health. Eating routines are not easily habituated, yet everyone knows their importance to the developing child. The period of food weaning should be gradual but definite. The very young child should be served his meals alone and before the other members of the family eat. It is asking too much of the youngster to sit at the table and to be denied the food enjoyed by adults or to wait until they have finished with their eating and talking. As he grows older he should be trained in good eating habits and desirable table manners.

The sleeping habits of children are the responsibility of parents. Sufficient restful sleep is healthful. Hence, each child should have regular hours for sleep from earliest infancy onward. He should be trained to go to bed and to sleep without receiving undue attention from his mother or other members of the family. The establishment of regular sleeping habits during childhood

that are continued throughout life have an excellent hygienic effect upon adults as well as upon young people.

Walking is an adventure that develops gradually with physical growth. Parents should not insist that their child form his walking habits too early. They should be willing to wait until sufficient maturation has taken place. A child can be trained to walk gracefully and with an upright carriage. Speech habits formed during childhood tend to persist. Parents and other adults therefore should be careful of their speech and choice of words. They should speak clearly and distinctly and encourage children to do the same.

It is during childhood that an individual achieves his first understanding of the value to him of proper health habits and regular care of his body. Boys especially tend to become impatient of too much of what they term mother's fussing. However, such matters as the avoidance of infection or contagion through the establishment of cleanliness habits, the care of the teeth, and the avoidance of cold-producing stimulations can be made a part of the habit patterns of the child whose parents give him sensible guidance in these matters.

The adolescent tends to be both careless and careful about his physical health and appearance. Teen-agers are tempted to take chances that later may result in a weakened physical constitution. At the same time they become increasingly conscious of their physical appearance, and they may go to extremes in order to gain attention. At no other time in his life does an individual need so much to be taught the value of moderation as during this period. The food that the young person eats, the kinds of activity in which he engages, the regularity of his sleeping habits, and the care that he gives to his dress and grooming constitute the bases of an exceedingly important part of adolescent training. Recognizing the growing independence of young people during these years, parent and teacher approach in these matters should be indirect but definite if problems of youthful resentment of dictation from his elders are to be avoided and if the young person is to enter adulthood with physical health and good habits of personal living.

Adjustment to mental ability. A child may show early signs of extreme brightness but later may slow down and indicate no more than average ability. Parents sometimes overstimulate

this child and hope that he will continue to display his precociousness. If the parents' expectations are not realized they make the child's life miserable by charging him with laziness, indolence, or lack of appreciation of what they are doing for him. He often is made to feel that he is personally responsible for his lack of expected achievement. Thus, his interest in further learning is lessened rather than stimulated.

During his early childhood, on the other hand, a child may give the impression that he is dull. Along with growth he develops greater ability to master learning material and he faces the obstacle of establishing in the minds of his elders the fact that he can succeed well in mental activities. There is a tendency on the part of a growing child to accept his family's and teacher's evaluation of his degree of mental alertness. He strives to do what others expect from him. To the extent that adults appear to have confidence in his ability to achieve he is stimulated toward further progress.

The normal adolescent is filled with lively intellectual curiosity and a strong urge toward self-expression. Mental conflict may arise when he attempts to evaluate varying modes of behavior and to pattern his own conduct upon whatever models appear to him to be the most worthy of imitation. If the young person can be helped to recognize traditional or environmental reasons for differing standards, and if thereby he can attain an intelligent appreciation of the most acceptable modes of thinking and acting, he can evolve personal ideals and behavior patterns which will resolve these incipient conflicts and induce a satisfactory mental adjustment to his adolescent environment.

Importance of emotional control. Other factors being equal, an attractive physique combined with average or better than average intelligence predisposes toward desirable emotional behavior. The environment in which a child develops, however, is a potent factor in his total personality development since it supplies the stimuli that will determine the extent to which emotional control will be achieved. It is easy to recognize that situations such as personal thwarting, failure to achieve a desired goal, inability to satisfy inner urges may lead to emotional imbalance. There are many stimuli in the child's environment that may lead to stresses and strains even though they may not be directed at him personally. These affect him emotionally

and he either adjusts to them satisfactorily or becomes maladjusted. He is bewildered by quarrels between parents, by parental rejection of himself or parental overprotection, and is worried about financial matters or illness in the family. As a result, the young person may develop anxiety neuroses.

The influence of the home upon a child develops in him certain attitudes that are helped or hindered by his experiences in the school. Parents are responsible for the emotional adjustment of very young children. Parents and school people share the responsibility for the behavior habits of the older child and adolescent.

"In a good home environment a young child is introduced to the need of simple acts of self-control or self-discipline and is helped to practice them. As the child enters the larger environment of the school and its accompanying wider association with more and different persons, he finds himself in situations in which his simple habits may not function, and he needs further guidance toward the development of other desirable social habits. He must be stimulated toward the attentive performance of classroom activities. He must be helped to understand that his classmates as well as he have the right to achieve success in learning. He must be led early to recognize the fact that a teacher needs the co-operation of every pupil in the class, and that unco-operative behavior on the part of any pupil cannot be allowed to interfere with the teaching and learning.

"It cannot be assumed that an individual, unaided, will be able to attain a satisfactory control of his behavior as he passes progressively through his various educational levels. Therefore it is the function of teachers, from the nursery school through the college level, to give this guidance toward desirable behavior adjustment, using whatever disciplinary measures (techniques of control) they find efficacious. Such measures should be administered objectively and understandingly, and they should stimulate the individual pupil toward intelligent co-operation in the work of effecting desirable changes in himself. Most important of all, these disciplinary measures or behavior controls should be aimed primarily not at the teacher's obtaining overt co-operating behavior but at the pupil's attaining greater inner control or self-discipline. This self-discipline should not be limited to control of classroom behavior but should function in

every activity in which participation demands control of any urges toward undesirable behavior." [1]

An adolescent usually is a person of strong impulses. The extent to which the expression of these impulses is satisfying or annoying to himself arouses in him conflicting states of affection and sex excitement, sympathy, elation, enthusiasm, fear, anxiety, melancholy, regret, anger, revenge, jealousy, and scorn. An important function of adolescent adjustment is the gradual learning to control not only the overt expression of an emotional state but also the intensity of the state itself. If he hopes to become an emotionally-controlled adult, the adolescent must learn not to take his emotions too seriously. Emotional immaturity not only is a source of unhappiness to the individual but also a cause of emotional disturbance for those with whom he is associated.

If, during adolescence, the individual continues desirable health habits begun in childhood of sleep, diet, satisfying work, and energizing recreational activities, he will be able better to meet emotion-arousing stimulation. Moreover, the adolescent should be introduced to such stimulating situations gradually so that he may have an opportunity to adjust to one set of stimuli at a time rather than to be thrown into a kind of mental and emotional chaos by the onslaught of a barrage of such stimuli.

Sex adjustment. Education aimed at adjusted home and family living and relations between the sexes is becoming a matter of growing concern among parents and other educational agencies. The ever-present question of what information about sex matters should be taught to children, when it should be given, and in what form continues to challenge all who think about the problem. Because of their own lack in training many parents hesitate to make the approach. Consequently, they are tempted to avoid it and to let the child learn as he can. In our present society the child is likely to receive information from other children about his body structure and functions earlier than many parents suspect. It is therefore important that each child receive, before he is stimulated by misinformation, an understanding of the process of birth, of the parts and functions of his body, and of his maturing relations with the same and the opposite sex.

[1] From L. D. Crow and A. Crow, *Introduction to Education*, pp. 305–306. Copyright, 1954, by American Book Company.

The establishment by the young infant of desirable health habits of elimination, cleanliness of body, and the prevention of body manipulation are forms of indirect sex education. Children are curious and tend to become unduly interested in matters which their elders appear to want to keep from them. Hence a young child should become accustomed to seeing, as a matter of course, the naked bodies of other children of both sexes. Structural differences between the male and the female should be observed by him and accepted so that, later, curiosity concerning sex differences may be lessened.

Since the child finds security in affectionate behavior, it should be practiced by the family as a matter of routine. The father or mother should not show great affection toward one child and indifference toward the spouse and other children of the family. Demonstrations of affection should be accompanied by sacrifice of personal wishes and by the doing of kindly acts for one another so that the child may experience affection in its broadest connotation.

His own body and everything concerned with it and his life processes are very important to the child. Hence, unless he is inhibited by the attitude of his parents, he is moved to ask all kinds of questions about himself. He is entitled to know where babies come from and that sister is different from brother in some respects. He should be taught the correct names of body parts, such as navel, rectum, buttocks, anus, penis, testicles, and vagina. The child should know that a new baby is formed in its mother's body. He should know also the father's part in the creation of the new life. Information of this kind, however, should be given gradually, objectively and tactfully, and fitted to the child's maturing power to understand it and to appreciate its significance to himself and his own behavior.

When these natural phenomena are presented wisely, openly, and naturally — not as secrets of which one should be ashamed — the child will learn to give them the same unemotionalized respect that he has for any other information that is presented objectively to him. However, there is always the problem of the adjustments of one child to the experiences of another child who may be less well informed and who has developed the wrong attitude toward all sex matters. As more and more parents are enabled to deal with this area of education, such conditions will tend to correct themselves.

Sex information in and of itself does not guarantee protection from the development of undesirable sex conduct. Study of learning outcomes seems to indicate that *to know* is not synonymous with *to do*. Unless wholesome attitudes of respect toward themselves and toward their parents and members of the opposite sex are developed in children along with the giving of information about sex, unhealthful interests and practices may be encouraged. From early childhood onward, the young person must be taught to exercise self-control and consideration for others in all phases of human relationships. Moreover, the best preventive against undue interest in sex matters is the provision of plenty of opportunities for participation in energy-releasing, satisfying, and healthful work and play activity. It is when a young person has little else to occupy his thoughts and his time that he turns to undesirable practices that pertain to self.

As the child nears puberty he needs to be prepared for the changes that will take place within him. New sex urges may cause him to want to experiment with his own body or with other boys' and girls'. The effect upon adolescents of the beginnings of adult sex life depends in great part upon the amount and kind of preparation that has been given them by their elders. To the erroneously informed or the noninformed young person, these changes may be accompanied by severe and often damaging shock. Although a boy usually does not experience the same emotional disturbance at the approach of puberty that may come to a girl who is unprepared for her first menstruation, he may develop feelings of anxiety as the result of the physiological changes of seminal emissions. Healthful, objective information concerning the probable appearance of these phenomena at puberty will do much to counteract the conflicts that may arise in the adolescent boy.

The attitude of the girl toward her physiological functioning is dependent upon the attitude of her mother and her other advisers. Menstruation may start early and be relatively regular and free from accompanying disorders. With some girls, however, the function may be delayed, irregular, or painful. In any case girls should be led to understand the relation that exists between this physiological change and their future marriage and motherhood responsibilities.

During the early years of adolescence a boy or girl may find

himself or herself unexpectedly attracted to members of the opposite sex. The schoolmate or the neighborhood playmate who yesterday was a nuisance or a bore suddenly takes on magnified qualities of desirability. Adolescent "puppy" love or crushes upon adults of either sex may be experienced. The entrance into one's life of new urges may seem to change completely habitual attitudes and activities. Routine tasks become intolerable and personal appearance becomes a matter of great importance. The young person's behavior, especially in the presence of the object of his newly developed interest, may become unduly aggressive or unusually shy and reticent. The adolescent does not realize that he is not so much "in love" with the object of his adoration as he is with love itself as he is passing through the stages of the development of sexual maturation. If he has received wise sex education in his preadolescent days, is given ample opportunity for association with members of the opposite sex, and is not exposed to distorted sex attitudes on the part of his elders, he will be able to make satisfactory adjustments to his developing sexual urges.

Social adjustment. After a child becomes aware of the other individuals who comprise his social environment he tends to regard them as the means through which he may attain personal satisfaction. He needs to be trained to modify his purely self-centered interests and to cooperate in the activities of and for the welfare of others. He early imitates the speaking and eating habits of his family, and gradually reflects attitudes learned in the home toward elders — friends, casual acquaintance, tradespeople, and others with whom he comes in contact. Attitudes of extravagance, thrift, suspicion, trust, quarrelsomeness, peaceableness, social or anti-social behavior that are exhibited in the home are carried by the child into his relationships with persons outside the home. The environment thus becomes an important consideration in the social adjustment of young people.

With adolescence, the individual is initiated into new and different social adjustments. He may develop strong altruistic and religious tendencies. He may desire to reform the world and to become a martyr in the cause of social welfare. His growing acquaintance with world progress and problems may stir him toward self-sacrifice and self-subordination and he may be impelled to emulate the deeds of the leaders of social progress

about whom he has studied. Or he may develop so great an appreciation of himself and his own importance that he comes to look upon the world as his "pigeon." Thus he may be led to demand rather than to give and may come to look upon himself as the rightful recipient of adult concern of his welfare. No matter what his attitude toward others may seem to be, the average adolescent at one and the same time wants to be independent and also feel secure in his relations with others.

If adolescent conflicts are to be reduced, young people need to be provided with plenty of opportunity to engage in challenging and stimulating study or work and recreational activities. The busy adolescent usually is the well-adjusted adolescent. His many interests and natural urges have a chance to express themselves in forms of behavior that, while they are stimulating, are aimed at wholesome preparation for the taking on of adult responsibility.

GUIDANCE TECHNIQUES IN LEARNER ADJUSTMENT

An understanding of the child is basic to any help or guidance that may be offered in his behalf. If we expect to be of aid to each learner as he attempts to make adjustments to the forces and factors in his environment, then those of us who are given the responsibility of promoting his welfare must prepare ourselves so that intelligent counsel and guidance may be offered. The child is forging ahead and needs to have the way prepared for him. He must come to understand its values and to recognize obstacles as well as his own potentialities as these are operative in his moving along that particular road.

Meaning of guidance. Much has been written on guidance, personnel work, or counseling, yet there is little guidance in the way of its specific application to the actual work of the school. In its largest connotation guidance can be conceived of as being as broad as education itself. Any aid or assistance that is rendered a learner rightly can be considered to be guidance. However, guidance has come to be interpreted as a phase of education that functions in relation to child development and adjustment. The functions of guidance are served best when an individual learner so is advised and aided that he is stimulated to make needed adjustments for the realization of his personal and social

growth and satisfaction. There is an implied activity on the part of both the person who is being guided and the one who stimulates activities along well-directed lines of endeavor. From the point of view of the authors, "guidance is interpreted as a conscious, organized factor of the individual's school environment that is designed, directly or indirectly, to assist him in his adjustment to all phases of living. It is the handmaid of mental hygiene in education." [2]

Need of guidance. Pupils evince the need of guidance in mental activity, in behavior that has individual and social implications, and in the selection of a field of vocational work. Seldom can an individual, unaided, make his own choices or his own decisions for his own best interests.

It is true that the need of guidance is more easily recognized in times of crises than when life runs along smoothly. However, if the right kind of guidance is experienced as a matter of course, it is wholly possible that a particular crisis confronting a young person can be avoided. It is the duty of the parent, the teacher, or the youth leader to discover the personal problems of the young people for whom they are responsible and to help in the resolution of youthful conflicts. Among the conditions or situations that may bother young people can be included the following: physical characteristics, style of clothes, extent and kind of home duties, degree of success in school, recreational activity, degree of security or insecurity, attitude toward others, deciding about a vocation, and any one of a hundred or more real or imagined problems that face the young person during his maturing process.

As we consider the number of maladjusted individuals even in our own immediate environment, we recognize the need for more adequate guidance of child behavior and attitude. Delinquency is born in the environment, but if a child receives the proper help at the proper time he may be saved many trying experiences. "Parental" schools have come, have gone, and may come again. But delinquent behavior continues. As a result of an increase in delinquency, educational leaders in a certain large city are combining at the time of this writing in a recommendation that "bad" boys be segregated in a twenty-four-hour

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[2] From *Mental Hygiene*, Second Edition, by L. D. Crow and A. Crow, p. 300. Copyright, 1951, by McGraw-Hill Book Company, Inc.

school so that they may be trained in a carefully controlled environment. The need of guidance is recognized by any one who works with young people. A person, however, should not be expected or permitted to engage in guidance work unless he has received careful training in the utilization of techniques that have been helpful to workers in the field. Some of the important techniques that are used for effective guidance and that should be understood by all teachers are treated briefly in the following.

Adjustment inventories. In the chapter on personality evaluation were presented various evaluating instruments that deal with attitude and adjustment. The results of tests such as these should be made available to every teacher or personnel worker so that he may be able to consider carefully the profile of a child whom he is helping as it is revealed through the use of these means. However, even though the validity and reliability of an evaluating instrument may be high, it still is true that long experience in working with test results is required before an individual is able to interpret them as a means of making guidance effective.

Anecdotal records. Anecdotal reports of children's behavior are becoming increasingly popular in some school systems. There is no standard form to be used. Those now in operation have been adapted to meet the requirements of the particular schools in which they are found. The central idea of this procedure is to observe children constantly and to keep a written record of events as they occur from day to day.

The anecdote should be a clear statement of the facts of the case. In addition, there should be an interpretation of the situation by the observer. In a separate statement might be included the observer's recommendation. There is value in the accumulation of a large number of incidents since thereby can be obtained a picture of the general behavior of the child or the young person. Of course, accounts of desirable as well as undesirable behavior should be included in these anecdotes. They then become invaluable to a teacher or a counselor as he continues his guidance work with any particular learner.

Some of the limitations of anecdotes and their preparation, and cautions concerning their use, are summarized briefly by Traxler:

1. It is apparent, of course, that an anecdotal record can be valuable only if the original observation is accurate and correctly recorded; otherwise, it may be worse than useless. . . .

2. Many persons find it extremely difficult to write with complete objectivity, but practice will do a great deal to overcome the tendency to intersperse the report of behavior with statements of opinion. . . .

3. A pernicious but fortunately rare use of anecdotal records is their employment for the defense of the person making the report. The central purpose of every anecdotal record is to help the entire school staff to obtain better understanding of a given student. . . .

4. It is evident that there is danger in lifting a behavior incident out of the social setting in which it occurred and in reporting it in isolation. . . .

5. At best, only a small proportion of the total number of significant behavior incidents for any pupil will find its way into anecdotal records. . . .

6. Some persons fear that anecdotes, through preserving a record of unfortunate behavior incidents on the part of certain pupils, may prejudice their success long afterward, when the behavior is no longer typical of them. There is ground for this fear if the school carelessly allows the anecdotes to fall into the hands of irresponsible persons. . . .

7. It cannot be emphasized too strongly that the adoption of a system of anecdotal records is no small commitment and that it will add inevitably to the load of the entire school, particularly the counselors and the clerical staff. . . .

8. It is obvious that the indications in the anecdotal records should be studied and an attempt made to improve the adjustment of the pupils when the anecdotes show that better adjustment is needed. . . .

9. Undesirable behavior, because of its nuisance aspect, is likely to make a stronger impression on teachers than desirable behavior. There is some danger, therefore, that the total effect of anecdotal records will be negative rather than positive. . . .

10. Occasionally teachers will observe incidents that are not at all typical of the behavior of the pupil concerned.[3]

The cumulative record. The records now used in most school systems are of the cumulative variety. By this is meant that the record forms are so devised that they permit the continuous recording of information about an individual. The records are placed in a central office so that data can be added to them

[3] From A. E. Traxler, *Techniques of Guidance*, Revised Edition, p. 131. Copyright, 1957, by Harper & Brothers.

during the school life of the pupils. The keeping of these permanent records has great value for those counselors and teachers who take their guidance work seriously.

According to the judgment of some educational leaders, the Minneapolis Public Schools Cumulative Record Card is a most carefully organized device, the directions for the use of which are worded definitely in a manual that is distributed to each person who is concerned with its use. It is interesting to note the guidance implications of the instructions on "When to Consult the Cumulative Record Card." Because of its guidance value this list of directions is presented below.

The Cumulative Record Card should serve as a means of helping to know pupils as individuals. Although it is not expected that any one teacher will use the card for all these purposes, the following are suggestions regarding how to use it.

Examine the records:

of new pupils to help you get acquainted with them more quickly at the beginning of the term.

of pupils not working up to class level for suggestions as to reason.

of pupils not happy or not well to see if the reasons are apparent and aid can be given.

of pupils of unusual ability to help you in finding extra work for them.

of all pupils in a class before dividing them into small groups for instruction.

of pupils who are absent frequently to find an explanation for their absence.

of pupils who misbehave to discover reason and suggestions as to how to handle them.

of pupils for whom special aid such as lunches, clothing, or scholarship is being considered.

before advising pupils concerning their electives in ninth grade or senior high school.

before advising pupils regarding vocational school courses.

before conferring with parents about their children.

to discover pupils of exceptional talent in such special fields as art, music, athletics, or creative writing.

to determine the capacity of pupils in your group.

to determine the growth made by pupils year by year.

to help you in making out report cards.[4]

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[4] From Minneapolis Public Schools, *Manual Explaining the Pupil's Cumulative Record Card*, p. 1. Superintendent of Schools, Minneapolis, 1947.

"For the purpose of giving guidance in any area whatever, teachers as well as counselors should become expert in the use of all records that are available concerning the learner. The record is a factual document. It is the function of the user to interpret its contents to the advantage of the individual concerned.

The case study. This technique involves a comprehensive study of an individual, including items of his history from birth onward and an interpretation of the facts that have a bearing upon his behavior. It is used in education especially for the study of maladjusted children — those who have been singled out by the school authorities for one reason or another. The compiling of a complete case history is the responsibility of a social worker or other specialist but qualified teachers and other members of a school staff are being trained to make effective use of this procedure. The ultimate purpose of the compiling of a case history is to evaluate present behavior in terms of background factors and experiences.

The form to be used and the procedures to be followed in making a case study have not been standardized, since these should be adjusted to the particular needs of the situation in which the study is used. However, it should follow a somewhat set form and contain data that are included in the cumulative record form used by the school concerned. An outline for the case study method that is adaptable for general school use as presented by Rivlin is reproduced below.

The Complaint

Reason for referring this pupil for special study (Include a detailed account of the incident, if possible, giving the time, place, and circumstances.)

The probable immediate cause of the incident

The approximate length of time during which this type of behavior has been manifested

Any other complaints by the same person or by others

The name and relationship to the child of the person making the complaint (Does this person make complaints about many children?)

The Child

Present Status

Age

Sex

Grade __ class __ teacher's name

Physical Appearance
    General impression made by the child
    Obvious physical or mental limitations
    Neatness and condition of clothing
    Mannerisms
Personality Traits
    General emotional tone; for example, cheerful, moody, etc.
    Attitude toward his family
    Attitude toward his school
    Attitude toward his friends
    Attitude toward himself, his abilities, and problems
    Play life
    Hobbies
    Educational and vocational ambitions
    Marked likes and dislikes
    Unusual fears
    Any special personal problems?
Educational Status
    Present school achievements
    History of retardation or acceleration
    Special deficiencies and proficiencies
    Past record in work and conduct
Results of Medical Examination
    Physical defects
    Efficiency of sensory organs
    General condition of health
    Nutritional status
    Comparison with normal height and weight
    Muscular coordinations
    Reduced or exaggerated reflexes
    Twitching, tics, tremors
    Peculiarities of gait or speech
    Previous health history
Results of Mental Examination
    Mental age
    Intelligence quotient
    Results of achievement tests
    Special abilities
    Special disabilities
    Vocational aptitudes and interests
The Environment
  The Family
    The individuals living at home

Apparent economic level
Apparent social status
Parental methods of discipline
Parents' emotional disposition
Attitude toward this child
Possibilities of securing the home's cooperation
Record at other social service agencies
The Neighborhood
Recreational facilities
Housing and living conditions
Desirability of his playmates
Any special obstacle to adjustment [5]

All available information concerning each of the items presented in the foregoing outline should be assembled, organized, and studied. In addition, the child should be observed in various situations. Interviews should be held separately with the parents, and with parents and the child. Interviews also should be held with the child alone and therapeutic measures applied. The parents, the teacher, the child himself, and the guidance counselor or specialist — all should work cooperatively toward the rehabilitation of a maladjusted child.

The interview. There usually are certain personality facts that can be understood and evaluated properly only through the intimate and informal relation that is possible in a well-planned and sympathetically conducted interview. It is the function of the interviewer, by tactful questioning and intelligent and patient listening, to probe beneath the mass of material already obtained through other techniques of evaluation. The interviewer thus can discover the primary bases of the present state of the individual's attitude or behavior so that whatever adjustment or readjustment is needed may begin at the core of the difficulty and not concern itself merely with surface behavior patterns or irritation.

The interview is an important technique of guidance but a difficult one to use. It can be successful in achieving its purpose only when and if the principles of good interviewing are thoroughly understood and practiced. The success of an interview, therefore, depends upon the attitude of the person to be inter-

[5] From H. N. Rivlin, *Educating for Adjustment*, pp. 108–110. Copyright, 1936, by D. Appleton-Century Company.

viewed, the personality of the interviewer, the conditions of the interview, the procedures employed, and the attitude of the interviewee and of the interviewer toward the results of the interview.

The interviewee. If the interviewee voluntarily seeks help and is ready to be frank about himself, his desires, and his needs, there is more likelihood that the results will be valuable than if he is brought to the interview against his will. If the individual fears the interviewer, is self-conscious in his presence, or feels that the interviewer is critical of him or his conduct, free response will be inhibited and important facts concerning himself and his interests or ideas either will be omitted or will be falsified. In general, the higher the intellectual and educational level of the interviewee, the more productive of desirable results will be the interview. An unintelligent or illiterate interviewee tends to have set notions or beliefs concerning himself and his potentialities and interests which cannot be broken down so that constructive evaluation may take place. However, in spite of high intellectual and educational status, an emotionally unstable or neurotic person may be so "shut in" that he is unwilling or unable to cooperate with the interviewer.

The interviewer. The interviewer must be a thoroughly adjusted person, must possess a sympathetic, understanding nature, and must like people. He should be a person of broad experience who is shock-proof. Nothing that the interviewee tells him should appear to be abnormal, improper, or terrifying. He must have known what it means to be misunderstood, to suffer for the mistakes of others, to be unjustly accused of wrongdoing, or to have experienced mental and emotional conflicts. If the interviewer has met such situations successfully and has achieved for himself desirable personality adjustment, he will be enabled thereby to assist others in achieving the same degree of stability.

The interviewer's manner should be dignified and reserved so that his judgment will be respected; but he also must be friendly and must be able to meet the intellectual and social level of the interviewee. A sense of humor is a great asset, but the interviewer should not wear a perpetual smile or adopt a "jollying" or "kidding" attitude. Interviewing is serious business, especially when the subject expects thoughtful consideration of his problems. However, a smile or a casual comment in a lighter vein

may do much to relieve tension and to bring about rapport between the interviewer and the interviewee.

Preparation for the interview. The interviewer should have a clear understanding of the purpose of the interview and should have familiarized himself with all the available data concerning the case. He also should have a definite but flexible outline of what he expects to do in his interview and the results he hopes to achieve. Circumstances may develop during the interview that necessitate certain deviations from the prepared plan, but the main objectives should be kept in mind at all times.

If the individual comes to the interview voluntarily but without an appointment, it sometimes is difficult to obtain the desired data immediately. It then is advisable to conduct a short interview at that time in order to discover the individual's reasons for coming and to arrange with him a definite appointment (not too long delayed) for a more detailed consideration of his problem. This will afford opportunities for reference to records, for arranging for the administration of helpful tests, and for conferences with other persons who may be able to contribute further preparatory data. If, however, the need seems to be urgent or if a delay might lessen the subject's willingness to cooperate, all these preparatory activities should be waived. The interviewer then must rely upon his ability to acquire the necessary data as best he can during the interview.

The interview itself. The interview should be held in a quiet, cheerful room that is free from distracting influences. If it is possible, the subject should be given a comfortable armchair in which he can relax. In order to give themselves an opportunity to watch facial expressions some interviewers place the chairs so that the interviewee faces the light. This is a most unhygienic procedure. If either is to face the light, it should be the interviewer himself.

The first few minutes of the interview should be devoted to the task of setting the subject at ease and helping him to orient himself to the situation. The method of attaining this attitude depends upon both persons, but it presupposes ease of manner and friendliness on the part of the interviewer. The interviewer's questions should be clear, simply stated, and definite; answers should be listened to quietly with a minimum of interruptions. If, however, the subject does not seem able to make his points

clear he may be asked questions as aids to thinking; but these questions should in no way suggest that the interviewer desires or expects certain specific answers.

The interview should close promptly when its purpose has been accomplished so far as is possible at the time. The dismissal of the subject should not be abrupt or final. Opportunity for further conferences should be made easy, and if such a conference is desirable a specific time should be set for it. The interviewer should avoid causing the subject to feel that he is glad to see him leave. However, time should not be wasted in meaningless chatter. The subject should always leave the interview with the feeling that he has gained a tentative suggestion that will be helpful to him.

Follow-up. Whether or not a diagnostic interview requires a follow-up interview for the same purpose depends upon the nature and extent of the problem. There probably will be need for subsequent interviews with the same person or with others for adjustment purposes. The success of the first interview often can be measured by the willingness of the subject to return to and to cooperate in succeeding interviews.

Value of the interview. To the extent that the interview accomplishes what it purports to achieve, it is of inestimable value as a guidance technique to all persons responsible for the attainment by young people of desirable social goals. The teacher, the social worker, the doctor, the personnel worker, the employer, and the psychiatrist are aiming at the realization of different objectives as they conduct interviews. In every case the effectiveness of an interview depends upon the spirit in which it is conducted.

The child or young person who needs guidance toward better school or social adjustment, the family that needs help in the solution of financial or personal problems, the patient who is suffering from physical or mental illness, the worker who is experiencing difficulties on the job or with his fellow workers, the applicant for a position — all come to the interview with a specific need for help. They can best achieve their own self-direction and self-realization if the assistance offered them is objective, tactfully and sympathetically given, and based upon a background of thorough training and broad experience. The interview pre-eminently is a medium for wholesome and healthful interactions of human personalities.

QUESTIONS AND TOPICS FOR DISCUSSION

1. What major adjustment problems do we have today because of the last world conflict?
2. Show why an individual's own attitude toward his assets and liabilities is more important than the valuation placed upon them by others.
3. In what ways can the application of mental hygiene help an individual adjust to the conflicts and problems which he faces?
4. What recent experiences have you had that have challenged your well-being? What food and sleep habits have you developed that are not best for you? Have you overcome them? How?
5. Explain why it takes time to recover from an intense emotional experience.
6. Distinguish between wholesome and unwholesome utilization of emotional reactions.
7. Trace the development of affective behavior of the individual from his early experiences to those experienced in effective adult family living.
8. Give reasons why behavior controls should be practiced early in life and in the respective situations in which an individual finds himself.
9. What is an effective program of sex education for (a) the young child? (b) the preadolescent? (c) the adolescent?
10. Justify the statement: "The preschool period is the most important period of individual adjustment."
11. Discuss the teacher's role in the guidance of learners.
12. How can the teacher make use of the interview with the parents of a maladjusted child? with the child himself?
13. Study a child for a week or two by keeping anecdotal records of important phases of his behavior. Interpret the data to the members of your class.
14. Use the outline of a case study presented in this chapter and make a brief study of an elementary or high school pupil for whom records are available.
15. What do you consider to be the chief values of the cumulative record?

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